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EDITORIAL ANNOUNCEMENTS.

THE BRITISH AND EASTERN CONTINENTS edition of the Railroad Gazette is published each Friday at Queen Anne's Chambers, Westminster, London. It consists of most of the reading pages of the Railroad Gazette, together with additional British and foreign matter, and is issued under the name Railway Gazette.

CONTRIBUTIONS.—Subscribers and others will materially assist in making our news accurate and complete if they will send early information

of events which take place under their observation. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired.

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VOL. XL., No. 18.

FRIDAY, MAY 4, 1906.

Q.—Will Congress pass a "rate regulation" bill this session?

A.—It will.

Q.—What are the useful ends to be accomplished by such a bill?

A.—First, expedition and simplification of the processes of the law so that the wronged shipper may obtain justice without its costing him more than it brings him. Second, extension of the law so that the burden of proving a rate "just and reasonable" will lie on the carrier. Third, free access by the Interstate Commerce Commission to railroad accounts and memoranda that should be known.

Q.—How about rebates and discriminations?

A.—Already covered by existing law. The pending legislation neither adds to nor subtracts from it.

Q.—Will the Hepburn Bill accomplish the desired things?

A.—Not in its present form.

Q.—Why not?

A.—Because it requires the Commission to perform legislative acts, which it cannot do under the constitution.

Q.—How can this be remedied?

A.—By so amending the bill that the Commission is confined to administrative acts.

Q.—What would such an amendment provide?

A.—It would provide that the Commission, after investigation of a rate, should declare what is the just and reasonable maximum rate, thereby administering the existing law that rates must be just and reasonable.

Q.—In what way does the bill, as it now reads, differ from this?

A.—It provides that the Commission shall proceed when it shall be of the opinion that rates are unreasonable, and that it shall determine and prescribe what will in its judgment be the just and reasonable rate. By the exercise of its opinion, it is compelled to become a law-making body instead of a law-administering body.

Q.—Are there other unconstitutional provisions in the present bill?

A.—Yes, but they would probably not invalidate the whole.

Q.—What are these provisions?

A.—The bill provides that, in failure of an agreement between the carriers concerned, the Commission may prescribe the terms and conditions under which through routes may be operated. This, of course, includes the number of trains that may be run, etc., and vests the Commission with the entire, absolute power of Congress; power which it cannot constitutionally hold. The bill also provides cruel and excessive penalties, which is unconstitutional. It also provides, through a blunder due to striking out the original court review provision, that the carrier is prevented from showing any objection to an injunction served upon it for violation of an order, except objection to the form of the order. This involves the taking of property without due process of law, which is unconstitutional.

Q.—With these clauses changed, would the bill serve its purpose?

A.—There still remains a provision, probably constitutional, but excessively foolish, which forbids carriers from keeping any other kinds of records than those ordered by the Commission.

Q.—Change this clause and the unconstitutional ones—will the Hepburn Bill become workable?

A.—It will be well worth trying.

It is seldom that so clear and complete an analysis and comparison of the work of any department of a railroad is given as that of the paper on "Actual Locomotive Efficiency" recently read before the Pacific Coast Railway Club and reproduced in another column. It is especially interesting and valuable in that it shows the relative advantages that have accrued of recent years from the introduction of the larger locomotive and incidentally of the large car, though the car does not enter into the consideration of the paper. It is not to be expected that the cost would fall in a direct ratio to the increase of tonnage hauled, and this, of course, does not occur, but it is significant that, as the tonnage is increased, so in almost every case has the cost of transportation fallen away. The records show, too, that the large locomotive is economical from the standpoint of the cost of repairs per 1,000 ton miles. If these figures are compared with the increase of tonnage hauled, it will be seen that they are accompanied by an increase of cost per engine miles, as has often been stated before. But this is by no means in proportion to the work done. Undoubtedly much of this is due to improved shop facilities, since there can be no doubt but that, with those available twenty years ago, the cost of maintaining the modern large locomotive would have risen beyond all bounds. This, however, is a matter that can well be left to those interested in shop management.

Of quite unusual interest are the tables printed in another column which show the ruling grades of all the transcontinental lines at present in operation except the Great Northern. In several instances it has been possible to make an interesting comparison with the situation as it existed in 1893. Thus, the Canadian Pacific has reduced its ruling eastbound grade from 116 ft. to 52.8 ft., between Vancouver and Revelstoke, and its ruling westbound grade from 116 ft. to 66 ft., between the same points. Grades on the Harriman route from Omaha to Portland, via the Union Pacific, Oregon Short Line and Oregon Railroad & Navigation have been reduced, eastbound, from 91 ft. to 43 ft., between Cheyenne and Laramie; from 63 ft. to 43 ft. between Laramie and Granger, and from 90 ft. to 66 ft. between Pendleton Junction and Portland. Westbound, they have been reduced from 66 ft. to 43 ft., between

Laramie and Granger; from 66 ft. to 44 ft. between Granger and Ticeska, and from 74 ft. to 26 ft., between Pendleton Junction and Portland. From Granger to Omaha, 854 miles, eastbound traffic now encounters no grade in excess of 43 ft. to the mile. The maxima from each of the reports furnished are as follows: Omaha to San Francisco, 116 ft. eastbound, 106 ft. westbound; Omaha to Portland, same; New Orleans to San Francisco, 117 ft. east and westbound; Montreal to Vancouver, 116 ft., east and westbound, except for single pusher grade of 242 ft., between Hector and Field, B. C.; St. Paul to Tacoma, 116 ft. east and westbound; Chicago to National City, 175 ft. eastbound, 185 ft. westbound. Of the new lines, the Western Pacific announces a maximum of 52.8 ft., but says nothing of the ruling grades further east, on the Rio Grande Western and Denver & Rio Grande. The existence of a ruling eastbound grade of approximately 116 ft. on five routes from the coast, the Union Pacific, U. P.-O. S. L.-O. R. R. & N., Southern Pacific, Canadian Pacific (except for the single pusher grade noted) and Northern Pacific, is noteworthy.

POINTERS IN STREET RAILWAY CAPITALIZATION

The prolific subject of street railway capitalization which, in the form of "hindsight," grows in prominence during an epoch of corporative criticism, cannot, unfortunately, be subjected, in any large and general degree, to accurate tests of figures. The best we have are the annual reports of the state railroad commissions or of those other bodies—or single officials—to whom the annual blanks of street railway companies must be returned. Often those blanks are defective and their specifications obscure. Some commissions insist on corrections; others do not; and not seldom one will find errors—in one case, which we have in mind, reaching a mistake of more than \$10,000 a mile—in the clerical footings after the blanks have been handed in. Still one must do the best possible with the new material on hand such as it is, and from such new material contained in the reports of Pennsylvania and Maine for the fiscal year ending in both cases June 30, 1905, one can distill some striking facts absolute and contrasted. The Pennsylvania report is made by the State Secretary of Internal Affairs; that for Maine by the state railroad commission of three members.

The secretary of the former and larger state speaks as the Irishman said, "straight from the shoulder," on the subject of overcapitalization of electric railways. Listen to some of his words: "Financiers have almost gone wild in the way of investing money in these methods of local transportation. . . . Many of them have been failing from a financial standpoint but this has not been due entirely to a failure to receive a requisite amount of remuneration but too often it has been due to excessive capitalization"—that is to say, large fixed charges on railways built on bonds eating up income. The secretary also indulges in regretful retrospect. He is sorry that rigid laws were not passed early to check fictitious capitalizing so that "many of the citizens of the commonwealth would have been relieved from the frauds which have been committed as a result of fictitious capitalization which has so generally characterized the financial affairs of street railway corporations." Then comes an amusing *non sequitur* which may indeed be called an anti-climax. The secretary, while disclaiming the idea "that it is ever too late to do right," thinks, as the existing street railway companies have been allowed to over-capitalize that "to pass a law now which would restrict corporations hereafter incorporated would seem unjust discrimination." This unique theory of making the best of a vested evil by perpetuating and expanding it, as propounded by a high officer of the second state in the union, is commended to the prayerful attention of the economic moralists.

An analysis of the returns for Pennsylvania street railway capitalization is attended with some difficulty owing to uncertainties of statement and lack of summaries. But, taking the secretary's own return of \$387,112,703 for total capitalization in stock bonds and other debt with an operated mileage of 3,169 for 117 corporations controlling many subsidiary lines, the approximation of \$122,125 per mile is reached. The figures certainly are not pigmy. But they do not bulk so enormous when compared with about \$148,000 in a group of Eastern states which, besides Pennsylvania includes New York, New Jersey, Delaware, District of Columbia, Maryland, Virginia and West Virginia; nor the \$112,000 in the southern states; nor the \$109,000 in the United States, taken as a whole, as returned last year and probably about the same now. As a brief palliating clause may also be mentioned Pennsylvania's many and somewhat costly city lines—though her mileage cap-

italization hardly squares with the \$50,772 per mile in the emphatically urban commonwealth of Massachusetts, which, under the long enforced replacement value rule, may be accepted as a kind of limit by honest capitalization for states with large urban communities.

By way of contrast to Pennsylvania we turn among the new state commission reports to that of the state of Maine where eighteen operated street railway corporations return a total mileage of a trifle more than 380 miles and total capitalization of only \$38,649 per mile. While including a considerable number of cities, Maine contains none that can be reckoned large and the state is essentially non-urban and with population scattered. On the face of the returns, for causes not apparent, she seems to have escaped the general tempest of trolley infection or at any rate has not felt its stronger gusts. The situation there, by the way, has some localized meanings. President Mellen, in financing through southern New England his great aggregation of between 600 and 700 miles of electric lines under the Consolidated Railway Company as a holding corporation has had to pay high prices for original water. President Tuttle, of the Boston & Maine, if he secures legal sanction for a similar policy in Massachusetts and northern New England will be largely spared the hydrostatic experience—though he will be lucky if he finds his electric ventures as profitable in ratios as the earlier and greater enterprise of his Connecticut colleague.

As the reports come in of those state commissions which have cognizance of the street railways, while one finds an occasional novel utterance or suggestion, the leading feature is the new impressiveness which old facts assume. Passing such odd and inconsistent happenings as the latitude allowed to electric railway inflation in western states which have been so eager to "raid" the steam lines, the conclusion must be reached, as a general truth now of national dimensions, that it is too late to "dessicate" the electric lines originally dropsical. Consolidation has blended watered and unwatered stocks inextricably. The quick and keen original promoter has often shifted holdings to the innocent investor and new obstructive legislation has been piled up on the first statutes on which the earlier evil was based. We face too the telling fact of railway history that if the first promoter was both forethoughtful and sharp he played successfully on a public weakness which in the first stages of the electric railway demanded the new service at any price—and in certain regions is still making the same demand. If the unwatchful public makes a fool of itself it must expect to be fooled, to find the men who will fool it and to pay the final penalty. But it by no means follows that because the public has been fooled once it ought to be or will be fooled again; and the time is probably near, if it has not already come, when Lincoln's famous proverb fits the electric railway situation. However that may be it is certain that, as regards new construction, most of the ills of electric railway stock watering are past—not only because legislators have awakened to facts and to perils but also because the conditions which made electric railway hydraulics so profitable in popular centers have been exhausted.

THE CHICAGO TRACTION SITUATION.

Although two recent events have added fresh complications to the already over-complex traction situation in Chicago, the street car using public is possessed of the belief that present conditions point to at least a temporary solution of the transportation problem. This belief is based, in part, on the feeling that the conditions could not be worse and that any change will be an improvement. Another basis of the belief is the fact that the recent events have weakened the positions both of the traction companies and of the municipal ownership propaganda, and that each will be compelled by public sentiment to make concessions. Still another reason is the apparent willingness of the traction companies to build their lines and improve their service. They have finally come to realize that the most effective method of allaying the municipal ownership agitation is to minimize the causes for complaints against the transportation facilities.

The more important of these events was the decision of the United States Supreme Court which wiped out franchise claims estimated at \$60,000,000 to \$70,000,000, and caused a slump in Chicago traction stocks aggregating \$20,000,000. It made the street car companies occupants without legal rights of streets in which 30 per cent. of their lines were being operated, these lines including their most important trunk roads. In its decision the court passed on the validity of the so-called "ninety-nine year" claims which were

based on an act of the legislature meant to extend grants made to the original companies by the city in 1858 and 1859 from 25 to 99 years. These grants covered nearly all the trunk lines entering the business district and the claims of the companies placed them in a strong position in their negotiations with the city for the expiring franchise on other lines. The Supreme Court sustained the validity of the act of 1865, but held that by reason of the ambiguity of its terms it did not extend the life of the grants made by the city to the companies. A petition for a rehearing will be filed, but the chance of the Supreme Court reversing itself is regarded by the lawyers as exceedingly remote.

The financial effect of the decision is to leave the companies without a basis of substantial value for half their capitalization. Aside from tangible property, estimated to be worth \$28,000,000, the companies have unexpired franchises running from a few months to ten years on a large mileage of the outlying lines. In addition to these lines the companies have the right under the decision of the Supreme Court, to remain in possession of and operate 43 miles of single track, covered by the ninety-nine-year grants, until the city exercises the right to purchase.

The companies estimate that these unexpired rights cover 70 per cent. of their mileage, but they admit that the 30 per cent. of the mileage which they are operating without legal right includes the most important parts of the traction systems. The unexpired franchises cover disconnected lines, many of them cross-town roads, which are valuable principally as feeders for the trunk lines. Many of these franchises expire this year, about 50 per cent. of them within the next five years, and all of the remainder by 1916. No satisfactory estimate of the value of these rights can be made, but practical railroad men have placed on them valuations ranging from \$10,000,000 to \$20,000,000.

The Union Traction Company, which operates the lines of the North and West divisions of the city, is largely over-capitalized and the Supreme Court's decision leaves its stock issues without tangible values beneath them. The bond issues of its underlying, constituent companies, the North Chicago Street Railroad Company and the West Chicago Street Railroad Company, about equal the tangible assets plus the unexpired franchise values.

Assuming that these franchise values aggregate \$10,000,000, the Union Traction Company's financial condition is as follows:

Assets.	
Tangible property	\$15,000,000
Franchise rights	10,000,000
Total	\$25,000,000
Liabilities.	
Union Traction Company, stocks	\$32,000,000
West Chicago Street Railroad, bonds	17,903,000
West Chicago Street Railroad, stocks	11,224,200
North Chicago Street Railroad, bonds	7,800,000
North Chicago Street Railroad, stocks	6,169,900
Total	\$75,097,100

The Chicago City Railway Company, which operates the principal system in the South division of the city, has no bonded indebtedness. It has outstanding stock issues of the par value of \$18,000,000. A little more than a year ago a syndicate, headed by J. Pierpont Morgan, paid \$200 a share for 92 per cent. of the stock, which fixed the market price capitalization at that time at \$36,000,000. Assuming that the franchise rights of the Chicago City Company are worth \$5,000,000, the following will indicate the financial condition of the company:

Assets.	
Tangible property	\$13,192,231
Franchise rights	5,000,000
Total	\$18,192,231
Liabilities.	
Capital stock	\$18,000,000
Excess of market price over par value	18,000,000
Total	\$36,000,000

These figures indicate that against a par and market price capitalization of \$111,000,000, there are tangible assets of only \$28,000,000. It must be noted, however, that Union Traction stocks never sold at par, the \$20,000,000 of preferred shares selling from around 60 to 18, and the \$12,000,000 of common from 16 to 6. Chicago City stock sold for \$200 only a short time, the outside price prior to and since that time having been around \$190. Since the slump the shares have sold at \$150. The valuation of the tangible properties given above are estimates submitted to the City Council by Bion J. Arnold, the well-known electrical engineer and traction expert. The estimate on the tangible property of the Union Traction Company was made in November, 1905.

Elements of speculative importance have prevented the stocks from dropping to the basis of tangible property values. These elements are: Present possession and operation, possibly for years,

until the city is ready to buy; large prospective profits during this time arising from the enormous earning powers of the companies, and the possibility of ultimately obtaining new franchises. With all possible expedition the city cannot take over the properties for more than a year, and the probabilities are it will be five years before municipal ownership could be brought about. In the meantime the companies must operate their roads. A majority of the members of the council favors giving the companies short-term franchises, and that majority may become large enough to override the veto of Mayor Dunne, who is forcing the municipal ownership issues.

The companies are offering to accept a 20-year franchise, which will give the city the right to purchase their properties at any time after five years, which is agreed to be the shortest period in which rehabilitation can be accomplished. The traction people undoubtedly believe that the municipal ownership sentiment will die out within the next five years, and that their possession for twenty years will not be interfered with by the city. The result of the city election on April 3 furnishes some foundation for this belief. Comparing the vote at that election with previous expressions of public opinion on the polls on municipal ownership, a radical change of sentiment on that question becomes apparent. In April, 1904, the question whether the city should refuse to grant franchises to the companies and compel them to operate under the police powers of the city was submitted to the voters. The vote in favor of the proposition was 120,863, and again, 48,200, in a total vote of 236,810, showing that 67,747, or nearly 25 per cent., of the voters did not express their opinions on the subject.

In April, 1905, the question was presented whether a franchise should be granted to any street railway company. At this election the vote for granting a franchise was 59,013; against, 152,135, the total vote being 330,935. Although it was a hotly contested election, with municipal ownership the principal issue, 119,789 voters, or 36 per cent. of the total number, failed to cast their ballots on the issue. These figures show that a large percentage of the voters were indifferent concerning municipal ownership.

At the previous elections the municipal ownership propositions had been academic in their nature. The vote had no binding effect on the city council further than the moral obligation created by the expressions of opinion of less than half the voters who cast their ballots at these elections. Two concrete propositions were presented at the last election. Affirmative votes would give them a legal, binding effect. One was, "Shall the city proceed to operate street railways?" On this question the affirmative vote was 121,916; negative, 110,323. The law requires a three-fifths vote to authorize operation. The affirmative lacked 17,428 of the 60 per cent. or 139,344 votes required, and the proposition was defeated. The other question was, in effect, "Shall the city issue \$75,000,000 of street railway certificates for the purpose of purchasing or constructing street railways?" The affirmative vote was 110,225, negative 106,859, showing a majority for the proposition of 3,666.

The defeat of the operation proposition is a serious embarrassment to the municipal ownership movement. During the campaign Mayor Dunne and his followers argued that municipal ownership without operation was no improvement on private ownership. They cited the experience of the city of Toronto to prove that divided ownership and operation is a failure. Urgent appeals to voters swelled the vote, but did not secure the adoption of the operation ordinance. The result will be that Mayor Dunne will be compelled, if he buys the properties, to lease them to the present companies or some new corporation, otherwise he must procure the approval of operation at some future election. In view of the falling off of the municipal ownership vote from nearly 3 to 1 in its favor to a bare majority, the success of such an effort appears doubtful.

The first move on the part of the city administration to accomplish public ownership will be to obtain a test in the courts of the validity of the street railway certificates. The constitutionality of the Mueller law under which they are to be issued must also be tested. The law makes the certificates a lien solely on the property purchased or constructed and prohibits them becoming an obligation of the city. Whether the city can issue bonds, limit the mortgage securing them to a specified class of property and escape liability itself is a new question in municipal jurisprudence, and the lawyers are divided on it. Not less than six months and probably a year or more will be required to test these questions. If the courts sustain the validity of the law and the certificates, then will follow the marketing of the securities. Time is required to negotiate a \$75,000,000 loan, even if there are no prejudices against

it. Financiers are not likely to encourage municipal ownership of public utilities in which they have millions invested. The new field of investment opened by this loan will be closely scrutinized. Before these questions can be settled a new mayor must be elected, new conditions may arise and further delay result.

In the meantime the people are clamoring for relief from the present inadequate street car service. The companies say that they stand ready to improve the service if given franchises, even for short terms. Some local capitalists have agreed to put money into reconstruction and equipment on franchises terminable at the will of the city if the municipality will guarantee the return of their investment with a fair opportunity for profit. This eagerness to obtain some sort of right to operate street cars is due to the desire to secure something from the wreckage caused by the Supreme Court's decision and obtain an opportunity to abate the municipal ownership sentiment by improving the service. Experiments in this direction made by the Chicago City Company last year have awakened the traction people to the fact that adequate, up-to-date transportation facilities constitute the most potent argument they can make against public ownership.

Some plan must speedily be agreed upon to give the companies the legal right to operate their lines in the streets in which they are now trespassers, but numerous difficult problems must be solved before the city and the companies can reach an agreement. In the first place, neither side is united and acting in harmony. Mayor Dunne's municipal ownership plans will be opposed by a majority of the new city council, which includes some of its strongest members. This majority has already started a movement toward the passage of franchise ordinances. Mayor Dunne will probably be able to prevent their adoption by the use of his veto power, and a deadlock appears inevitable unless concessions are made.

Antagonistic interests divide the traction companies. The Union Traction Company is operating the systems in the north and west divisions of the city under leases from the North and West Chicago companies. The latter are asking the courts to annul these leases on the ground that the rentals have not been paid for a year and a half, and that the company has failed to pay a floating indebtedness of \$3,416,000 it assumed with the leases. The underlying companies are also asking the courts to give them 205 miles of trackage operated by the Chicago Consolidated Company, which, they assert, was built out of their earnings, and order cancelled \$6,750,000 of bonds that are a lien on the property. Attempts are now being made to bring about an agreement between the Union Traction and its underlying companies that will enable them to act as one company. When this has been done the receivership of the Union Traction Company, involving taking care of \$6,000,000 of receivers' certificates, must be disposed of by the Federal court. Financial troubles are likely to follow this action, including a possible assessment on the Union Traction stocks.

After all these lawsuits have been disposed of and the Union Traction interests are united, negotiations may be expected to be inaugurated for the merger of the traction system of the three divisions of the city. With the Union Traction Company loaded with \$75,000,000 of securities on 305 miles of trackage and the Chicago City with \$18,000,000 on 220 miles, one of the difficulties in the way of a consolidation is apparent. Negotiations for a merger were opened several months ago, but they failed because the Chicago City Company demanded that the \$32,000,000 of Union Traction stock be wiped out on the ground that it represents so much water. The Union Traction people will endeavor to obtain an agreement that will give some value to these shares.

A side issue between the city and the Union Traction Company, but having an important bearing on the question of improving the service, is the removal of the river tunnels. The Federal Government has ordered them removed on the ground that they are obstructions to navigation. The company uses these tunnels for the operation of its cables. Pending the reconstruction of the tunnels the company has asked for permission to electrify its cable lines. Once the trolley is installed the public will not submit to a restoration of the cable service. Realizing this, Mayor Dunne has refused to grant the permits until the Supreme Court has passed on the petition for a rehearing, and the 99-year claims are finally and forever settled. The court is expected to decide the question in May, and, if favorable to the city, the first step will be taken toward a radical improvement in the service.

The drummers of Philadelphia who object to paying \$30 for a \$20 mileage ticket and getting their \$10 back again when the ticket is used up, and who have been blowing hot air (through

the newspapers) at the Pennsylvania Railroad for many weeks, have at last got the Attorney-General of the state of Pennsylvania to take action—or to say that he soon will do so; but the only really formidable argument that he offers is that the railroad takes the passenger's money to protect itself from the scalpers. Even if we assume that this is true, the basis of the claim is still hard to substantiate, for the sum extorted from each ticket buyer is not over 10 or 15 cents; and if the drummers love the mileage book as warmly as they seem to think they do, they ought to consider this trifling sum a small expenditure for such a great business advantage. The report of the Attorney-General's proposed action says that he will file a bill in equity in the Dauphin County Court against the Pennsylvania, the Delaware, Lackawanna & Western, the Lehigh Valley, the Cumberland Valley, the Buffalo & Susquehanna and the Erie roads, asking in the name of the Commonwealth for a perpetual injunction to restrain these roads from collecting a rebate of \$10 on each \$20 interchangeable mileage book sold. His chief arguments are that "the present practice forces the passenger to give bail for his conduct; takes the passenger's money to protect the railroads against scalpers; imposes all chances of loss of ticket on the holder; subjects the holder to unreasonable expense and annoyance; gives the railroads the use of the public's money without interest, and discriminates against one class of passengers." As the agitators of this alleged extensive public demand have from the first employed many words for few ideas, this elaborate analysis of their grievance is not surprising; but the real issue can be stated very briefly. They charge discrimination and oppression. As, however, the whole of the alleged abuse would be fully offset by a money allowance of the size mentioned above, it comes down to a question of over charge; ought the \$20 ticket to be reduced to \$19.90 or \$19.85, or some such figure? A passenger gives bail for his conduct when, instead of forcing the conductor to depend on the passenger's honor to pay, he buys a ticket. The chance of the loss of a ticket must necessarily fall on the passenger, whatever kind it may be. The other specifications in the argument are even more shadowy than these; and the charge that there is discrimination against the mileage-ticket holder, can be nothing but a boomerang, for the discrimination is the other way; it is in his favor. The passenger with a single-trip ticket costs no more to carry than does the drummer; why should the drummer pay less? Mileage tickets are supposed to be justified by the wholesale principle, and there is much solemn talk about the economic justification of the use of this principle for the benefit of traveling salesmen; but as these salesmen do not travel in carloads, or even in dozens, the argument has but the flimsiest kind of foundation. There is no justification for the mileage ticket but expediency; and every traffic officer knows that other considerations of expediency demand its abolition. What a heap of bother would be saved if we could only agree to let some Ohio legislature make all passenger rates! Then we could have a flat rate for all passengers.

Eight prominent Chicago wool buyers complain to the Central Freight Association that for several years the traveling freight agents representing roads east of Chicago, in the wool territory west of that city, have been in the habit of exceeding their duty in order to secure shipments of wool over their respective roads. "While we do not object to these freight agents soliciting wool's when ready for shipment, we do object to the unfair solicitation, in which the acts enumerated below form a good basis for complaint: Providing printed invoice blanks; buying wool from grower, weighing, loading and marking wool for buyers, paying for wool with dealer's draft; using telegraph blanks for dealers' business and using dealers' code books for frank messages; using railroad transportation, expense money and paying for livery to hunt up growers and keep Eastern buyers posted on whereabouts of same, prices asked and quantities for sale by them. In fact acting as representatives for Eastern concerns without remuneration and thus working against the dealers of this city." We print this merely as an illustrative example for the benefit of people who think that the Interstate Commerce Commission has an easy task when it sets out to suppress rebating. Here are a dozen different services which a railroad has done or can do for shippers or consignees, any one of which may have a substantial value, and yet which all together may be so shadowy as to thwart the most strenuous attempts to punish the offender in court. What does a two-day speech by Senator Spooner in Congress amount to, as against a two-day trip with a "livery" among the wool farmers of Utah?

The New Haven Register says that General Superintendent Shepard, of the New York, New Haven & Hartford, has issued a circular which "comes down on the men hard." Attendance at the instruction car has not been what it should be and the General Superintendent raises the query whether the efforts of the company to improve the means to fit men for promotion are appreciated. He is of the opinion that the men ought to acquit themselves of the inference that they are not ambitious and enterprising. To the out-

sider this circular raises the question whether the go-when-you-please method is the right way to educate trainmen. Why not make school attendance compulsory? Is there not an inconsistency in spending days and months of valuable time in the work of refining the rules of the standard code, or the air-brake rules, as though it were necessary to make of train-running an exact science, and then leaving to chance the settlement of the question whether or not the men know the rules? Either a man needs the knowledge or he does not; there can be no half way work about it. If attendance at lectures is voluntary, the dullest, who are most needy, will be the surest to stay away. Why should not every fireman be made to fully qualify himself in the air-brake art before running an engine on the road? "Fully qualify" means 100 per cent. in that branch of the catechism which deals with questions of safety—that is to say, almost all of the questions. What superintendent can go into court and for one moment justify a scheme under which, by the deliberate pre-arrangement of the company itself, engineers take a part of their lessons in the safeguarding of trains after they have been for months entrusted with trains? To state it baldly, firemen become engineers first, and learn air-brake refinements afterward. We notice Mr. Shepard's so-called "trimming" in this place because the principle applies not only to air-brake instruction but also to other things that trainmen should know. It is true that lecture-car instruction does not embrace the sum of all wisdom in this matter; a considerable percentage of the men are perfect in the car but need watching when on the road. But the lecturing is all-important in its place.

A "blower" went out of business in the Third avenue power house of the Brooklyn Rapid Transit Railway a few minutes after 10 o'clock on Sunday night, and as a consequence traffic on the Brooklyn bridge and on the cars running through the old section of Brooklyn became monotonously slow. The light furnished to the cars was inadequate, and much discomfort and annoyance to passengers were caused. The unsatisfactory conditions prevailed until about 11 o'clock.—The foregoing, from a New York city paper, forcibly suggests the query why we do not make better use of our telephones and other electrical facilities. Hundreds or thousands of passengers were kept in suspense for three-quarters of an hour. For that length of time a majority of the people in the cars were exercising their minds in fruitless debate—each within himself—of the question whether the failure of power would or would not be so complete as to warrant abandoning the cars and finding some other way to get home. As the delay was less than an hour we need not here consider the other hundreds of people waiting in suspense at home. And though this suspense of the passengers was complete, unrelieved by even the chance to indulge in plausible guesses as to the cause of the trouble, it is probable that every delayed car was within one minute—or at most two minutes—of a telephone. A telephone message sent from the power house, 10 minutes after the accident, in such cases to, say, 50 or 100 places along the lines, could be made the means of settling every passenger's anxiety. By proper prearrangement such telephone messages could be distributed as readily as the single message is sent to the superintendent's or dispatcher's office. By the use of the telegraphophone all the hundred messages could be sent at once. By the use of the telautograph all could be recorded at destination without human intervention. When a railroad train is stalled in the woods five miles from a town the passenger's impatience is usually a good deal mollified by the knowledge that he cannot liberate himself without the help of the locomotive, however hard he may try. But when civilization slips a cog in the heart of a great city, the gap between theories and results is painfully conspicuous.

Of judges who openly express their contempt for the law—such parts of it as do not please their individual fancy—New York City seems to have more than its share. Instances of judges rebuking policemen instead of the prisoners whom the policemen have brought into court are familiar to all readers of the daily newspapers, and poorly veiled expressions reflecting on other judges are not unheard of. The latest instance of contempt observed is an approval of trespassing on freight trains by Magistrate Crane. According to the published report, Judge Crane, on hearing the cases of four men arrested on the New York Central, said: "I think the New York Central is getting about all that is coming to it from the city." The men were charged by three representatives of the New York Central with stealing rides on freight cars coming from Albany. "I don't think," said the Magistrate, "that the road will become bankrupt through the free transportation of people who utilize their empty freight cars for free rides, even if the people are hoboos, and these men are evidently not hoboos. I admire their earnestness in the pursuit of work which brought them to this city." He discharged George Bissert and Joseph Zerrenner, both of Albany, and fined their companions, George Christy and Henry Dawson, of New York, \$3 each. The danger to the lives of the trespassers themselves seems to have had no more weight with the judge than the danger to trains generally, and the vicious example set for boys and

others who make of the railroad a pedestrian's highway. The earnestness of the judge in his effort to thwart the police officers of the railroad is equaled only by his innocence in regard to "earnestness" in the pursuit of work which the prisoners professed.

New York Central & Hudson River.

The past year has been one of more than ordinary importance in the history of the New York Central Railroad. There has been a great growth in earnings, several small independent companies have been absorbed, additional electric properties have been acquired, and large progress has been made on the pioneer work of electrifying the New York terminal.

In the earnings' account there was an increase in 1905 of \$7,522,393 over the preceding year. This brings gross earnings up to over \$86,000,000, and again makes the New York Central second as an earner only to the Pennsylvania Railroad and the group of roads controlled by the Southern Pacific Company. The freight earnings alone were \$52,000,000, a figure exceeded by the total earnings of only seven other companies. Freight furnished more than \$5,000,000 of the larger earnings, a gain due to a large increase in tonnage hauled and in the average haul of each ton, two influences which together overcame a decrease of 45/100 of a mill (0.045 cents) in the earnings per ton-mile, this decrease in the average rate being due to increased proportion of grain, coal and other low class commodity tonnage. Passenger earnings, \$25,761,387, showed the large increase of \$1,587,353, due to a larger volume of all classes of traffic. Mail and express earnings also increased by \$445,820, reaching the large sum of \$5,580,286.

Of the great gain in gross earnings, a large proportion went for expenses of operation, which increased \$5,398,663. Maintenance of way contributed \$496,754, maintenance of equipment \$2,277,250 and conducting transportation \$2,262,771, of the new working cost. Also more than \$1,500,000 was appropriated for addition betterments, leaving net earnings of \$24,594,851, an increase over 1904 of \$2,144,028. Charges on new debentures issued and adjustments of the tax account raised fixed charges and reduced the gain in net earnings by \$1,177,681. After payment of the 5 per cent. dividend there was a surplus of \$2,113,348, from which there was deducted \$1,500,000 as a special fund for new equipment and betterments, the exact amount similarly appropriated during the six months ended December 31, 1904, covered by the previous report. Thus the New York Central in its earnings strongly reflects the great prosperity of the past year, and at the same time, similarly to that great system which alone is comparable to it, the Pennsylvania, used a large share of the gain in increased expenditures, many of them by no means chargeable to ordinary expenses of operation.

Early in the last fiscal year a fraction more than half of the capital stock of the Rutland Railroad and all of the capital stock of the St. Lawrence & Adirondack were purchased for the New York Central & Hudson River. Results of operation of the St. Lawrence & Adirondack (65 miles) are included in the figures of the report. The Rutland, however, though shown on the accompanying map of the New York Central Lines east of Buffalo, issues a separate report which has already been reviewed in these columns. In February, 1905, the New York & Ottawa and the Ottawa & New York Railroads were acquired, adding 128 miles to the operated mileage and giving the New York Central an entrance into the capital city of Canada. Extensions in the Clearfield bituminous coal region of Pennsylvania added 66 miles more to the working mileage. In this territory, also, there was a consolidation of several small lines which had been organized in the New York Central interest. The Beech Creek Extension, the Clearfield Southern, the Pittsburgh & Eastern, and the Curwensville & Bower were consolidated into a new company called the Beech Creek Extension Railroad, which, with a mileage of 128 miles, was united to the parent road under a 999-year lease.

Following the example of the New York, New Haven & Hartford, a company has been created to take control of the electric lines held in the New York Central interest. This was done, however, not by making use of the charter of an already existing electric road, like the Consolidated Railway Company, but by incorporation of a new holding company with wide powers. This is the Mohawk Valley Company, through which control of the electric lines owned, mostly in the central part of New York State, is held. The year's acquisitions are the Rochester & Eastern Rapid Railway, operating an electric line between Rochester and Geneva, 40 miles, and one-half the capital stock, the other half being held by the Delaware & Hudson, of the Schenectady Railway, operating electric lines in the city of Schenectady, with branches to Albany, Troy and Ballston. In addition to these purchases, it is hard to believe that the New York Central is not connected in some way with the buying of the United Traction Company, which operates the city lines in Albany and Troy, by the Delaware & Hudson, which took over control of the Traction Company during the year.

Work on the improvement of the Grand Central Station terminal and the electrification of lines on the Hudson division to

Croton and on the Harlem division to North White Plains, has steadily progressed. The main power stations at Yonkers and at Port Morris are nearing completion, and work is under way on various sub-stations and transmission lines, so that present prospects are that electric operation can be installed during the present year as far as between the New York terminal and temporary terminals at High Bridge and at Woodlawn. Preparation for this work has involved an immense amount of improvement on the New York end of these two divisions. On the Spuyten Duyvil & Port Morris, and on the Hudson division in particular, large improvements have been made. These include extensive rock cutting for four tracks just beyond Melrose Junction on the Spuyten Duyvil line, the construction of a new yard and engine terminal at High Bridge, abolition of grade crossings and a new cut-off between Melrose Junction and Spuyten Duyvil, the building out into the river on the Hudson division north of Spuyten Duyvil of from one to six new tracks and the beginning of a large yard, much of it on new land, at Croton. Expenditures on work connected with the electrification amounted to over \$7,000,000 during the year. There has also been continuous betterment throughout the rest of the system, including the relief of main tracks between Albany and Buffalo by additional sidings, and more double-tracking, revision of grades and new sidings on the Pennsylvania division, to meet the great growth in bituminous coal traffic.

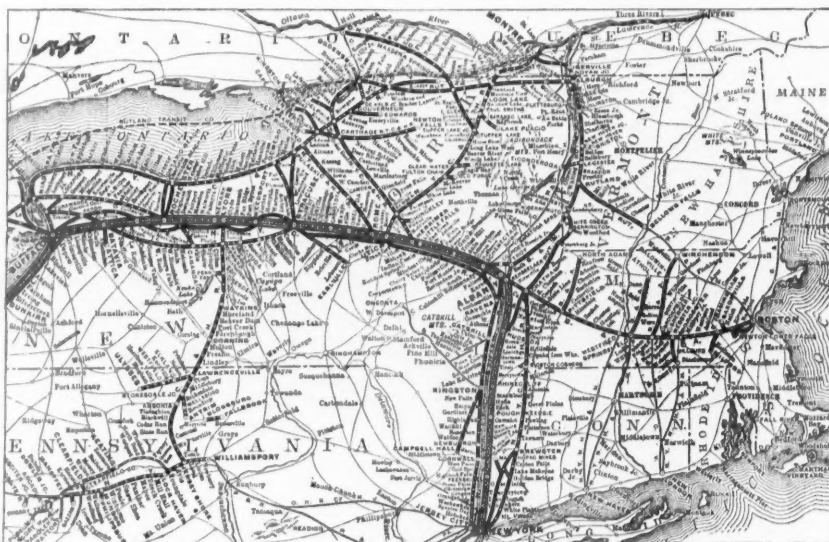
These improvements have been taken care of in various ways. The extraordinary expenditures during the year amount to no less than \$16,400,413, of which only \$2,715,491 was charged direct to cost of road and equipment on the general balance sheet, though other sums appear on the balance sheet as increases in advances for leased lines. For construction and equipment on leased lines there was spent \$8,744,865, in part charged against funds provided by the leased companies. Current income was called upon to the extent of \$1,314,277 for maintenance of way improvements and \$218,445 for additional equipment. At the same time, operating expenses included \$2,852,718 for equipment renewals, and there was charged against the special improvement fund \$553,618 for construction and additional equipment. Among the amounts expended for construction and equipment on leased lines is an expenditure of \$332,039 on the Beech Creek Extension Railroad, for 20 Class "I" passenger locomotives. This Class "I" type is the most modern Atlantic type racing passenger locomotive in use on the system. It is, therefore, obvious, even without actual observation of the fact, that these locomotives are not suited to the traffic of a 128-mile line in the Pennsylvania coal fields. As a matter of fact, they have regularly been used in hauling fast express trains on the main line. It is not possible, of course, to tell how much of the cost of these locomotives was paid by the leased line and how much by the parent company, but as a general question it would be interesting to know to what extent the resources of leased lines have been called on to provide for needs of the parent company.

Taking up the expenses of operation, which it will be remembered increased by \$5,398,663, maintenance of equipment shows the largest relative gain of \$2,277,250, or over 20 per cent. Maintenance of way works out at \$2,646 per mile on each of the 3,774 miles of main track operated, against \$2,699 on each of the 3,515 miles in 1904. Thus, in proportion to average mileage operated, there was small change in this account. This is equally true per mile of main, second, third and fourth track owned and operated, on which maintenance of way cost \$1,726 per mile in 1905 against \$1,720 in 1904. Looking at this expense from these two points of view it is plain that expenditures on the line have been liberal. Repairs and renewals of equipment cost \$2,561 per locomotive in 1905 against \$2,609 in 1904; \$643 per passenger car in 1905 against \$542 in 1904; and \$80 per freight car against \$56 in the preceding year. The large increase in maintenance per freight car came in spite of an increase in the total number of cars of over 2,000, and is reflected in an increase of \$1,633,219, or over 45 per cent, in the cost of repairs and renewals of freight cars, this being by far the largest increase in any single item under operating expenses. In addition to the large amounts spent under operating expenses, it must be remembered that there was in the income account also an expenditure of \$1,532,722 for new construction and new equipment (addition betterments) which lessened net earnings to that extent.

The tonnage hauled was more than 49,000,000 tons and increased 5,600,000 over 1904. There was an increase in the total ton-mileage of 1,430,000,000, or 17 per cent. The freight density was 2,577,839 tons one mile per mile of road, an increase of 217,522 tons. Freight earnings were \$13.916 per mile of road, and passenger earnings

\$9.028 per mile of road. The train load shows up well, with an increase of 27 tons over the previous year, bringing the figure for revenue freight to 399 tons, and for all freight to 459 tons. The average ton was carried 197 miles. The largest single item of freight traffic and the largest single increase during the year was in bituminous coal, a commodity in which the New York Central, through the ownership of its valuable soft coal properties and the efforts of an exceedingly efficient coal department, has succeeded in making a most important article of its traffic. There was also a strikingly large increase in tonnage of manufactures carried, thus adding another testimony to the general evidence of the immense increase in high grade traffic in trunk line territory last year.

Since the close of the fiscal year there has been authorized by the stockholders an increase of the capital stock of \$100,000,000, bringing the authorized total to \$250,000,000. Most of the \$150,000,000 previously authorized is now outstanding. Especially since announcement of this increase it has been feared by many that the company was overreaching itself in its large expenditures for improvements. This feeling is largely because there is no actual proof that there will be a saving in expenses or a gain in earnings in any degree commensurate with the expenditures involved in the new improvements. It is, however, more than reasonably sure that the management is pursuing the course of wisdom in leading the way in these tremendous improvements and that the ultimate result will be thoroughly profitable. Certainly, returns in the year 1905 show an earning power large enough to seem to insure



New York Central & Hudson River.

the stability of the company while the improvements are under way. The principal statistics of operation are as follows:

	1905.	1904.
Mileage worked	3,774	3,515
Freight earnings	\$52,312,331	\$46,932,254
Passenger earnings	25,761,387	24,174,034
Express and mail earnings	5,580,286	5,134,466
Gross earnings	\$86,095,602	\$78,573,209
Maint. way and structures	9,984,101	9,487,347
Maint. of equipment	13,238,125	10,360,875
Conducting transportation	34,300,221	32,097,450
Operating expenses	59,068,029	54,569,366
Net earnings	26,127,573	24,003,843
Gross income	32,651,072	30,472,580
Net income	10,408,570	9,407,758

TRADE CATALOGUES.

Ballast Cars.—"An Ocular Demonstration" is the title of a little pamphlet of the Rodger Ballast Car Co., Chicago, showing half-tone engravings of the Hart convertible cars, built by this company, in action, both center and side dumping and being plowed off with a Lidgerwood unloader; also views of sections of track on which material has been deposited with these cars and distributed with the Rodger plow car. A view of a drop-bottom gondola, with a number of workmen shoveling out the material remaining after dumping, is presented to contrast the results obtained by the two types of cars.

Atchison, Topeka & Santa Fe.—The passenger department is distributing a folder showing a dozen exterior and interior views of tourist sleeping cars, which fill an important office in California traffic. These cars have the conveniences of first class Pullmans, but the upholstery and fittings are simpler. A trip over the Santa Fe is a delightful experience, and some of these pictures suggest the sources of delight, but in other views the photographer seems

to have failed to catch the psychological moment; the expressions on the travelers' faces may deter other persons from joining California excursions. The human face divine is a ticklish thing to monkey with.

CONTRIBUTIONS

Improving Discipline by Recognizing Good Service.

Tucson, Ariz., April 23, 1906.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read with interest the editorial in the *Railroad Gazette* of April 13 on "The Unjust Seniority Rule," with reference to the improvement in railroad discipline as outlined by me, and while I do not presume to consider that my suggestions represent the only solution of the problem, it may be assumed that the present system of discipline is inadequate and that an improvement is both desirable and feasible. Therefore, as a possible elucidation of the several queries suggested by your article, I beg to say a word.

The question of "Conduct" appears to have been given undue importance. The highest standard desired in this respect is to impress upon the patrons of the company that all of its employees are gentlemanly and anxious to make them feel that it "costs nothing to be polite." An excessive degree of politeness is rather ludicrous, and on the other hand I have seen men enjoying but limited social advantages convey information so concisely and satisfactorily that it was a pleasure to transact business with them. So that, without discouraging "suavity," it may be said that if an employee has an interest in his work, he will take care of the "courtesy" end of it without any coaching. There should be no danger of the "suave" employee getting ahead appreciably, for this element of discipline weighs only 10 per cent. in the final result. At the same time this is sufficient to encourage politeness.

Therefore let us see what can be done to stimulate interest in the actual work. As you have said, it seems worth while trying to accomplish something in this direction. As I see it, the only way to get ahead is to make the employee feel that good work is going to be substantially rewarded; then you have him working for the company instead of spending half his time inventing excuses for work badly done. This accomplished, you relieve the executive officer from the necessity of continually investigating delinquencies, thus giving him time for doing his work. In train service we have a group of men who are held responsible for a certain result, under the leadership of one man. This group is known as the crew, and the head of it as the conductor. They are just as essentially a unit as a military organization, for they are working towards one end, and they should be dealt with as a unit. Failure to recognize this principle is bound to be detrimental to discipline and to the railroad company's interest. The crew must be made to feel that we are looking for results and are not desirous of comparing the moral or intellectual attainments of the several individual men. We must subordinate the individual to the group, and thereby make each one feel that his personal success is dependent upon the result of the joint labor of the entire crew. Cooperation is the keynote of success.

You say that the engineer and conductor may not get along together; but this is not logical, for men having a common interest will soon learn to eliminate personal likes and dislikes, particularly in business. Suppose you and your worst enemy were compelled to carry a basket of eggs to market, slung on a pole between you, and privileged to share in the profits of the sale—would you drop your end of the pole to spite the other fellow? I don't think you would, and furthermore, you would not worry about his dropping the other end either.

Then take the question of convenience in handling men as a group. There is a decided advantage in checking the record of five or six men at once. The conductor's report is made up by him for the trip and he is claiming all that he thinks they are entitled to. You check it against the train sheet and see what per cent. of schedule they made and make allowance accordingly. Say he was 30 minutes late getting out of the yard, and that each 15 minutes cancels five points of the 20 allowed. He has lost 50 per cent. of that item, and so on down the list. It is simply a question of percentage after the values of the respective items are once fixed. By that I mean the rating is established as standard permanently. There is no chance for favoritism. No "good judgment" is required. All you need is a good clerk—possibly two—to check up the records for a division and make the entries, and figure how many points should be cancelled from the report turned in for Bill Jones's crew on account of having lost three hours on the schedule and breaking in two the bodies of three flat cars by rough handling of the train. Don't you think Bill Jones would soon be able to figure this out himself and realize that there was "nothing in it" for his crew to do work that way?

I cannot see why any high priced official is necessary. The superintendent now hands out the "days" himself, and if any one

is called "on the carpet" he passes judgment on the case before it goes on record. The present practice of putting employees on the defensive has resulted in making satisfactory discipline almost impossible, and it takes more than half the superintendent's time keeping "tab" on his men.

Regarding the possibility of errors and the necessity of making incidental revisions. This could not be seriously considered as an objection to this or any other system, for corrections are in order at any time before the record is closed for the year, and there is no more liability in this matter than any other involving simple computations. Six per cent. of 100 is 6, regardless of whether it affects a man's record or your bank account, and when you consider that the men are going to claim all that's coming to them, it will readily be seen that the better the work is done, the less trouble there will be keeping the record. You cannot compare a merit system with a demerit system because the principles involved are diametrically opposite. In the former, information is voluntary and voluminous; in the latter you have to extract information with a corkscrew if you get it at all.

It is true that to establish such a system and educate the men up to it would involve considerable time and patience, and it would undoubtedly meet with opposition among certain classes of employees. The railroads would also feel that this record, properly kept, might involve considerable expense; but did you ever stop to think what it must cost a railroad company to maintain the elaborate system of reports intended solely for the purpose of checking up the service rendered by the men? These are reports that should be unnecessary and would be superfluous if the men could be induced to take a proper interest in their work. Simply divert this expense from useless records to handling an adequate system of discipline, and watch the results.

It is not necessary that such a system be inaugurated in its entirety, at once. Begin, say, with a record of the movement of trains, and reward the crews for good service. Issue a bulletin to the men advising that a premium is to be paid for good service and that the record of each crew will be started off at the same point. Let monthly bulletins be issued showing the rating of respective crews and announce that all those averaging above 75 per cent. will be entitled to one day credit for each per cent., that is 80 per cent. would mean five days credits, 100 per cent. 25 days credits, 125 per cent. 50 days credits, etc., and have this offset discipline (demerits) charged against their records and also be a factor in promotion. Wouldn't it be worth while?

On one point, however, I desire to take issue with you—that is, regarding the "tyranny" of the superintendent. If the truth were known your verdict would most likely be reversed, in the majority of cases. If he is obliged to measure men by the "rule o' thumb" and enter discipline against a man's record on a summary of evidence abstracted from unwilling employees there are always those on the "off" side who complain, no matter how just the decision may be. Why not eliminate this style of discipline and let the man's record stand for itself?

W. D. BEHRING.

Is the M. C. B. Air Brake Hose the Best for All Service Conditions?

TO THE EDITOR OF THE RAILROAD GAZETTE:

This question was brought forcibly to my attention on the road where I was employed during a severe winter when ballast trains were employed filling trestles. In December, January and February the delay to trains through hose freezing up, and damage to air pumps in the attempt to overcome leaks became very serious indeed, and was finally partially overcome by removing the hose frequently and drying them, while a fresh lot were put on in their places. This was well enough so far as it went, but we also had on the road a large number of flat cars engaged in log train service, and the trouble with these was even more serious and not so easily overcome. After they were loaded these cars were hauled some nine miles to a large division yard where they were made up into trains and stood pushed together until the road engine was ready to go on and start them on a 130-mile run to destination. It was found, as soon as the cars were moved, that 60 per cent. of the hose coupling joints leaked badly because the hose had been frozen solid in a short circle position, so that when cars were stretched out the coupling heads lifted and caused leaks, and the delay in getting these trains started on this account amounted in some cases to six hours. This was bad enough, but it was only the beginning of the trouble which it continued for the greater part of the run, and the record of skidded wheels removed from these log cars for three months was enough to make the old man's hair turn gray. I became convinced that the remedy lay in securing an air hose that would not act as the standard hose was acting, and we took the matter up with the air hose people, with the object of securing a hose that would be as light and flexible as possible, with thin walls, offering the least possible space for lodgment of moisture to freeze, and at the same time that would be strong enough to resist the bursting pressure of the air. It is not necessary to enumerate the difficulties we met with in securing what

we wanted, or anything near it, so hard it is to move people out of a rut.

Finally we accepted one out of the many samples submitted and applied it to the cars. Now this hose, although the best offered, was not what we wanted, nor was it anywhere nearly the best that could be made, yet the improvement was so great and so immediate that no sooner was one train equipped with the hose than the men whose duty it was to look after and handle the log train sent in urgent requests for a further supply, and by the time all of these cars were equipped the delays to trains had been cut down to practically nothing, while the number of skidded wheels was reduced to the proportion of one to eight. If anyone thinks it was not worth the small additional cost, just ask the Superintendent of Motive Power, the car men, and the engine drivers.

Finally the supreme test and recommendation came when it was found that the engine men on other trains stole the hose off the log cars to use in case of trouble. The next thing to be determined was whether the new hose had the life of the regular standard hose, and to determine this they were left on the cars, though the intention was to remove them in the spring, since, while they were 1¼ in. inside, they looked like a 1-in. hose from the outside, and car men used to remove them when going on foreign roads and report wrong hose.

They stood the time test well, but to my mind the most satisfactory test made was where one of these special hose was applied to the testing plant in the main yard and used every day under pressure of 110 lbs. for 18 months, and then returned to my office and it was still soft and pliable and full of life.

Therefore I maintain that the M. C. B. standard air hose of to-day is a long way from being the best procurable for the purpose for which it was intended, as the hose we developed will do all that the standard hose will do, and very much more besides. This may not be of much interest to railroads in the south, but I think I have proven that it is of very great importance to people who operate railroads where the thermometer goes down to 30 and 40 deg. below zero in a moist atmosphere.

STOREKEEPER.

American Railway Association.

The semi-annual meeting of this association was held at Chicago, April 25. There were present 190 delegates, representing 80 roads. The membership of the association now comprises 314 members, operating 226,096 miles, and the associate membership 19 members, operating 628 miles.

The Committee on Train Rules presented a general revision of the Standard Code of Train Rules for Single and Double Track, which was adopted by the association. The changes which have been made by the committee are the subject of an article in another column. There are few or no radical changes, but many rules have been put into clearer language, and there are some changes in practice.

The Committee on Car Service reported the adoption of the amendments to the Code of Per Diem Rules, changing the per diem rate for the use of freight cars from 20 to 25 cents, to take effect July 1, 1906; and on recommendation of the committee the association

Resolved, That a penalty for diversion should be imposed only in cases where cars are delivered to specified foreign roads contrary to the expressed wish of the car owners.

The report of this committee contains arbitration cases Nos. 28 to 32, inclusive, and gives answers to some questions concerning the interpretation of rules. The committee says that the amendment to Rule 6, adopted last year, has had the effect of putting non-per diem roads on the same basis as private sidings and has had satisfactory results. The idea that the per diem rate can be increased sufficiently to warrant doing away with the penalty rate is not favored by the committee; a high rate would interfere with the free movement of freight cars when loaded, and would unduly stimulate the movement of empty foreign cars. The committee does not believe in an automatic rule for the prevention of diversion; it would either cause delays, or unnecessary transfers, or unnecessary empty mileage, or all three. The resolution above quoted having been adopted, the committee intends now to prepare a rule prescribing a penalty for diversion.

The Committee on Safety Appliances presented statistics showing that the number of freight cars fitted with air-brakes on Jan. 1, 1906, was 1,652,297, or 89.8 per cent. of the cars reported as in service by members of the association. The number of members is 304 and the total number of cars reported is 1,840,009. The number of engines equipped with power brakes is 50,413, or 99.6 per cent. of the total number in service. The number of new freight cars under contract or construction on January 1 was 191,863, and of new engines 2,568.

The Committee on Statistical Inquiry presented a form covering railway transportation statistics and directions for making it out, which were adopted.

The Committee on Standard Cipher Code reported that the Standard Cipher Code was practically completed and would be dis-

tributed in the course of a few weeks. It will cost \$2.50. The Committee on Transportation of Explosives presented a plan for the formulation of a bureau for the safe transportation of explosives and other dangerous articles. The plan proposed by the committee was approved by the association, and the committee was directed to proceed with the organization of the bureau. The committee reports that 150 roads, operating 88,951 miles, had adopted the regulations for the transportation of explosives on March 19. Other roads are considering the matter. The proposition for the establishment of a bureau contemplates a formal organization, like that for the payment of car service on interchanged cars. Members agree to abide by the regulations, which implies refusing shipments of dangerous articles which do not comply with the requirements of the bureau. Provision is made for the appointment of a chief inspector and subordinate inspectors. Inspectors are to see that the regulations are complied with by manufacturers, shippers and railroad companies; to visit the works of each manufacturer every three months, or oftener, and to supervise the loading and transportation of explosives.

W. C. Brown, New York Central, was chosen President of the association, and W. A. Gardner, Chicago & North-Western, Second Vice-President. For members of the Committee on Train Rules the Chicago, Milwaukee & St. Paul, and the Lake Shore & Michigan Southern, were chosen in place of the Hocking Valley and the Louisville & Nashville.

It was decided to hold the autumn session of the association at Chicago, Oct. 24, 1906.

The Silvis Freight Yard of the Rock Island.

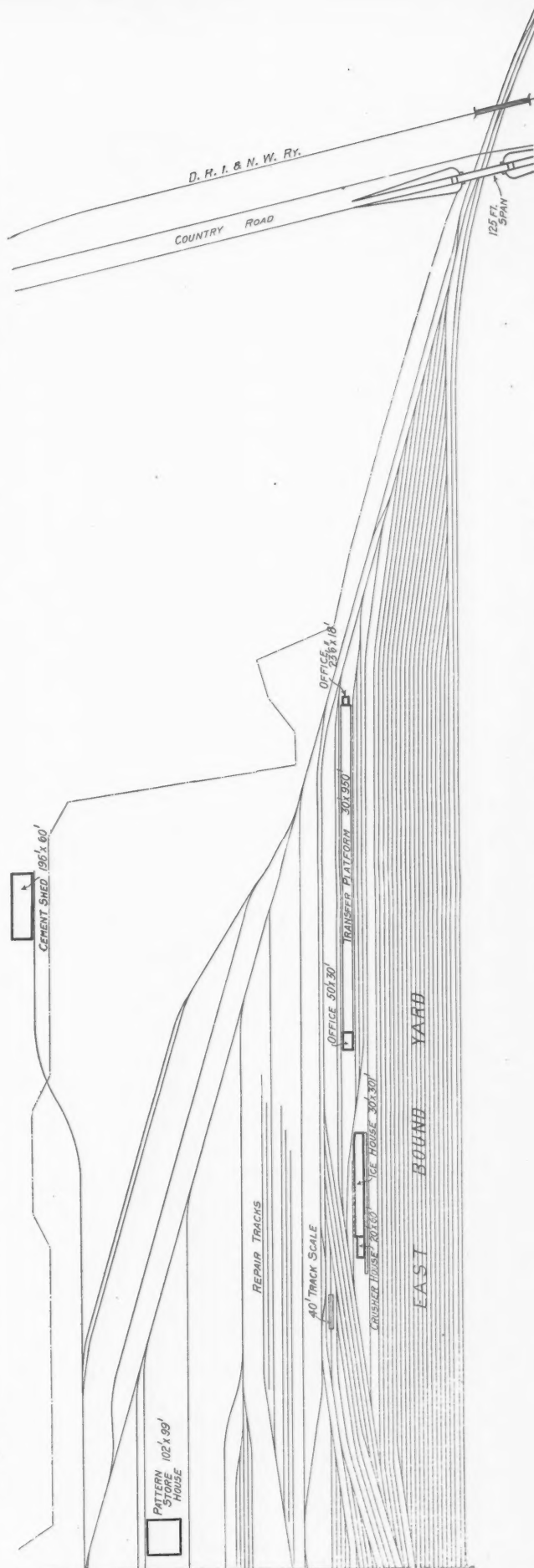
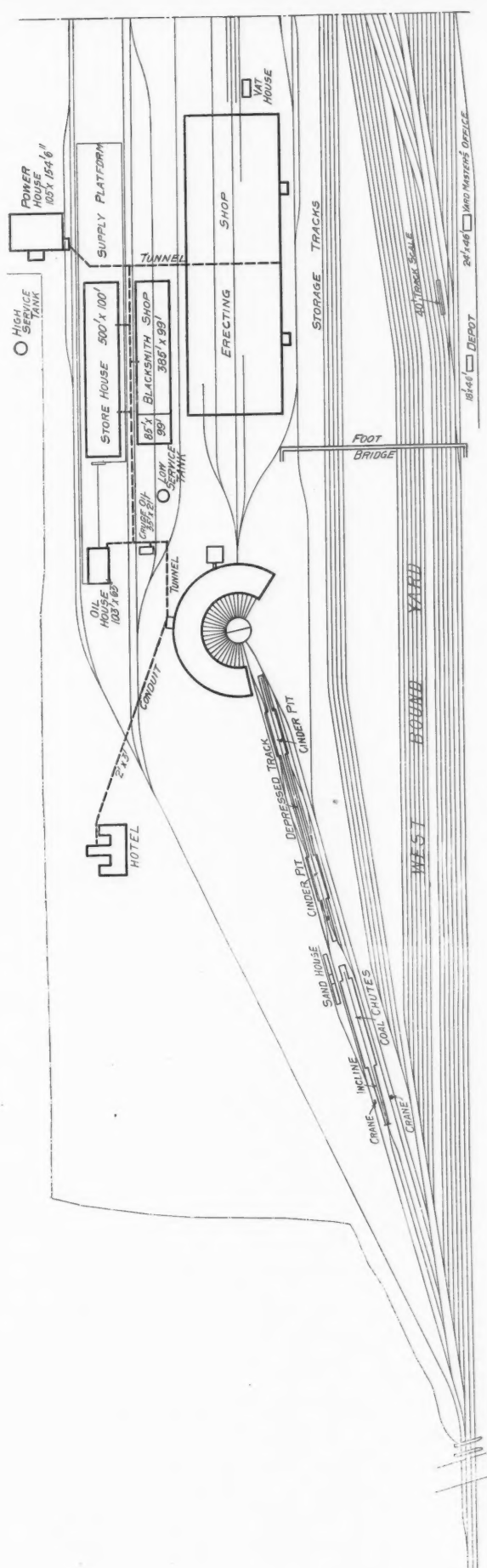
The original plan of the Chicago, Rock Island & Pacific for extensive new shops near East Moline, Ill., included a large freight yard between the main tracks and the shops. Construction of the yard was postponed, however, until after the shop plant was in operation. Work on it was not undertaken therefore until last summer and the yard was opened to service only in the present year. A plan of the yard is shown herewith.

Although in itself not a yard of exceptional size, in conjunction with yards already existing in the vicinity the aggregate capacity afforded is much the largest on the system. East Moline is 173 miles due west of Chicago and eight miles east of Rock Island, Ill. After crossing the Mississippi river at Rock Island to Davenport, Iowa, the Rock Island lines diverge in three directions—southwest to Kansas City, west to Omaha, and a connecting branch northwest. There is also a line from Rock Island southeast to Peoria. Five lines, therefore, center here. The capacity of the Natick yard at Moline is more than 800 cars, of the yard at Rock Island 600 cars, and at Davenport, on the west bank of the river, 500 cars, the combined capacity of the three being nearly 2,000 cars. The total capacity of the new yard is about 3,000 cars, so that there is now yard room in this territory for about 5,000 cars in all. Prior to completion of the new yard at Silvis, the name that has been given to the station formerly known as New Shops, the other yards mentioned were badly overcrowded. They will now be used mostly for local business and for storage. A plan of the Silvis yard showing its relation to the shops is given herewith.

The tract occupied by the new freight yard is about a mile and a half long by 500 ft. wide. The yard occupies part of the tract of 700 acres originally acquired for the new shops, which was all graded at the same time before the shop buildings were put up. Not a great deal of grading was necessary, as the ground was fairly level. For the freight yard alone about 32 miles of track were laid. The eastbound yard has 18 tracks, with capacity for 1,200 cars, and the westbound 12 tracks, with capacity for 1,030 cars. The storage track will hold about 500 cars. All main line and ladder track switches are interlocked. Other switches are moved by hand. There is a complete air-testing plant, the nearness of the shops making an abundant supply of air readily available.

The yard includes large engine terminal facilities at the west end. The entrance to the engine terminal is at the extreme west end of the westbound yard, although engines from or to the eastbound yard use the running track just north of the storage tracks. This arrangement permits free movement of engines to and from the round-house and the various facilities. The coal chutes have a track on each side, and engines may pass from these tracks to the ash-pits and thence to the turn-table, or around the ash-pits and directly to the turn-table. The coaling station is an 80-pocket Rock Island standard design, with inclined track approach. Cars are drawn up the incline by a 25-h.p. electric hoist. There are two double ash-pits, each 130 ft. long, enabling eight locomotives to be cared for at one time. The pits are the depressed-track, shovel-cleaned type.

Other yard facilities include an ice house 30 ft. x 301 ft., with loading platform and crusher house; a covered transfer platform 30 ft. x 950 ft., with office at the west end; and two 100-ton, 46-ft. automatic weighing track scales, one for each yard. The Silvis passenger station is on the south side of the main line. The plan



New Yard at Silvis (East Moline), Illinois—Chicago, Rock Island & Pacific.

also shows a steel foot bridge which has just been built, which crosses the tracks to the shop yard, just west of the station. A special feature of the terminal is a hotel located northwest of the round-house, for accommodation of the many trainmen whose runs end here. It is a frame building, which cost \$25,000, and is run by the Rock Island's dining-car department.

All of the work on the yard was done by company forces directly in charge of the Division Superintendent, under the supervision of Mr. H. F. White, Engineer of Maintenance, to whom we are indebted for the information and plan. The total cost, not including preparation of the site, was about \$300,000.

An Aggregate of Electric Railway Earnings.

A total of the gross and net earnings of—so far as possible—all the important street and electric railways in the United States has just been published by the *Commercial and Financial Chronicle*. The following is an abstract of the article:

It is no easy matter to obtain periodic returns of income, in a way at all comprehensive, for the electric railways of the country. It was formerly the policy of managers of street railways to pursue extreme and complete secrecy concerning the affairs of such roads. With the change, however, in the system of traction from animal power to electricity this policy has often had to be abandoned. In order to obtain means for making the conversion to electricity, new capital had to be enlisted. Furthermore, the numerous and extensive consolidations of street and electric railways have also been attended by the investment of much outside capital. Thus a new set of persons has become interested in these enterprises and these new owners have naturally insisted that they be kept informed as to the income and condition of the properties. Still, even now there are relatively few companies that give out monthly reports of earnings and less than half a dozen that furnish weekly statements. In New York State the Railroad Commissioners require the filing of income statements available to the general public every three months. Not as much can be said for other states. In fact, there are only a few states in which the street railways are required to furnish returns of any kind to the constituted authorities even once a year—from all of which the reader can judge of the difficulty of securing data regarding income for some definite and uniform period of time.

The effort has been to procure comparative figures of gross and net earnings from all the electric railways in the country except those inconsequential in extent and earning capacity. The figures sought were those covering the even calendar year. This has necessarily increased the difficulty of obtaining returns. For in the case of large numbers of companies the fiscal year and the calendar year do not correspond. In those states where annual statements are required by the state authorities—say New York, Pennsylvania and Connecticut—the fiscal year of the street railways quite generally ends with June. In Massachusetts the Railroad Commission asks returns from the street railways for the 12 months ending Sept. 30. In other parts of the country, where the state officials call for no returns, the fiscal years vary widely, some companies making up their statements to end with March, others with February, and still others with November or October—showing great diversity in the dates covered.

Notwithstanding these drawbacks we have succeeded in gathering a large number of returns for the periods desired—that is, for the calendar years 1905 and 1904. In some instances the figures are those of roads that furnish regular monthly statements, from which we have made up totals for the 12 months. But large numbers of others are those of roads which never supply figures for current periods and from which we have special reports covering the calendar year. The result is a comprehensive exhibit, covering no less than 163 roads. These 163 roads earned over \$200,000,000 gross and over \$85,000,000 net. In exact figures the total of the gross for 1905 is \$204,123,606, which compares with \$186,278,338 for 1904, thus showing an increase of \$17,845,268, or 9.58 per cent. The total of the net is \$85,553,639 for the calendar year 1905, against \$76,451,540 for 1904; an increase of \$9,102,099, or 11.91 per cent. In addition to the roads represented in these totals, 22 other roads have sent comparative figures of gross earnings but not net earnings. Adding these, the total of gross is brought up to \$211,085,131 in 1905 as against \$192,545,536 in 1904, the increase being \$18,539,595, or 9.63 per cent.

The totals thus reached, while in themselves large, fall far short of indicating the full earnings of the street and electric railways of the country. The results relate to the calendar year, but large numbers of companies with fiscal years differing from calendar years will not furnish totals for any other period of 12 months. Roads whose fiscal years end with June 30 or Sept. 30 are particularly numerous. We have undertaken, therefore, to carry our investigation further and see what have been the earnings for the latest fiscal years of the roads for these two sets of periods. Obviously, this method is open to the objection that results

do not cover a uniform period, but it may be recalled that even the United States Census Office, in its elaborate volume covering 1902, had to rest contented with a similar method.

In the following table to the total of gross and net for the calendar years 1905 and 1904 are added two other lines of figures, one the earnings of all the roads for which we have returns for the 12 months ending June 30, and the other the earnings of all the roads for which we have the figures for the 12 months ending Sept. 30. By combining the three we get a very comprehensive aggregate.

Roads.	Gross.		Net.	
	1905.	1904.	1905.	1904.
Calendar year below 163	\$204,123,606	\$186,278,338	\$85,553,639	\$76,451,540
Years ending Sept. 30 88	21,918,088	21,332,298	8,173,079	7,497,806
Do. June 30.....261	80,025,451	73,998,300	37,158,205	34,272,395
Grand total.....512	\$306,067,145	\$281,608,936	\$130,884,923	\$118,221,741
Increase.....	24,458,209		12,663,182	
Per cent.....	8.68		10.71	

The final total in the foregoing, it will be seen, shows aggregate gross earnings of \$306,067,145 in 1905 against \$281,608,936 in 1904, and net earnings of \$130,884,923 against \$118,221,741. The gain in gross amounts to \$24,458,209, or 8.68 per cent., and in net to \$12,663,182, or 10.71 per cent. Even these totals fall short of recording the entire earnings of the electric railways of the United States. The minor roads not represented in these figures would not swell the amounts to any very great extent, but, as it happens, there are a few large companies that are also missing because no data concerning their income can be obtained. Among these are the Chicago Union Traction and the Virginia Passenger & Power, both in receivers' hands; the Cincinnati Traction, the Denver City Tramway, the Omaha & Council Bluffs Street Ry., the St. Louis & Suburban, and also the Pacific Electric Ry. and other lines forming part of the extensive system of Huntington roads in California, besides a few other roads of smaller, but considerable, earning capacity.

It seems no exaggeration to say that if we could have returns covering all the electric railways in the country the total of the gross would run between \$350,000,000 and \$360,000,000. The census in its compilation for 1902 showed total gross earnings of \$247,553,999. The increase from this figure to about \$355,000,000 obviously reflects large expansion. Too, one gains a new idea of the importance of the electric railways from the fact that they should have reached a point now where their gross revenues exceed 350 million dollars. Earnings from the sale of electricity for lighting and power purposes are, to be sure, in some cases included in the totals, but in others, notably in the case of the Public Service Corporation of New Jersey, which, besides controlling practically the entire street railway business of northern New Jersey, also controls the gas and lighting interests of the greater part of the whole state of New Jersey, earnings only from railway operations are included. Hence, it can be truthfully declared that the electric railways of the country have been expanding their revenues in a noteworthy degree entirely apart from operations connected with the lighting and power portions of their business.

Washington Correspondence.

WASHINGTON, May 1.—An early vote on the final passage of the Hepburn railroad rate bill is now assured. By a unanimous agreement adopted yesterday the Senate has decided that on Friday of this week the bill shall be taken up to be read by sections for the purpose of amendment, the discussion on amendments to be under the rule limiting speeches to fifteen minutes each, and each amendment to be voted on as soon as its discussion has been concluded.

It is the general opinion that, under this limitation of debate, amendments will be disposed of rapidly, and that not more than three or four days will be required to complete the reading of the bill and the disposition of all amendments. It is the general expectation of Senators on both sides of the chamber that the final vote on the passage of the bill can be reached as early as Wednesday of next week. An agreement for a final vote on that day would have been made yesterday but for the objection of Senator Morgan, of Alabama, who gave notice that he would object to any proposition for fixing a definite time for voting. His reason for this objection was that if a definite time should be fixed there would be danger of a lot of amendments having to be voted on at the last moment without any debate. There seems to be no reason to doubt that the bill will certainly be passed before the end of next week, even if the vote cannot be reached as early as Wednesday. As it is certain that some amendments will be adopted, the bill, after its passage by the Senate, will have to be sent to a conference committee of members of the two houses, as it is not probable that the House will accept the Senate amendments without a conference, though there is little doubt that in the end it will be sent to the White House for the President's signature in substantially the form agreed upon by the Senate. The conference ought not to take a great deal of time, and the bill will probably be a law within ten days after its passage by the Senate.

There are in all about seventy amendments that have been of-

ferred in the Senate to the Hepburn bill, and are technically pending; but only those will be acted on that are formally offered by some Senator during the reading of the bill or at some stage before the final vote. The rules of the Senate as to amendments are very liberal, unless they are modified by an unanimous agreement, and there is nothing to prevent any of the amendments heretofore presented or entirely new ones being offered during the reading of the bill, or after the conclusion of the reading.

Most of the amendments that are formally offered will be defeated; many of them will be presented by Senators simply for the purpose of making a personal record on the bill. The principal interest will be centered in the judicial review amendment, in the various propositions to amend the provision conferring the rate-making power, and in the Foraker amendment proposing to permit the Commission to apply to a circuit court for an injunction against an unreasonable rate instead of having a formal hearing before the Commission and an order from that body.

The adoption of a conservative review amendment seems to be assured. It is probable that its foundation will be the amendment agreed to in the White House conference on March 31, and presented to the Senate by Senator Long, of Kansas. This will be modified in line with the suggestion of Senator Knox for the incorporation of a provision for the protection of the rights of carriers secured to them by the laws of the United States as well as those secured by the Constitution. This Knox amendment will probably be narrowed so as to limit the protection to those rights secured by the Interstate Commerce Act of 1887 and the acts amendatory thereof. The Long amendment will probably be further amended so as to permit proceedings for review to be brought in the circuit court in any district in which the railroad company has its lines instead of in the circuit court for the district in which the company has its principal operating office. This amendment is necessary in order to prevent the shutting out of the Southern Railway Company, which has its principal operating office in the District of Columbia, which is not included in any judicial district of the United States.

Several amendments to the provision conferring the rate-making power on the Interstate Commerce Commission will be considered, but it is probable that the principal change made will be the elimination of the words "in its judgment," which, it is now generally conceded, would require the Commission to exercise legislative discretion in the fixing of a rate, and which, if retained in the bill, would probably insure the entire measure being held by the courts to be unconstitutional. The clause requiring the rates made by the Commission to be "just and reasonable and fairly remunerative" will probably be allowed to stand, although propositions will be presented for striking out the words "and fairly remunerative," and for substituting for them a provision such as is favored by Senator Bailey requiring the rates to be such as will afford just compensation for the services performed.

Senator Foraker will make a hard fight for the adoption of his amendment providing for the alternative method of procedure for the correction of an unreasonable or exorbitant rate. There seems to be no ground on which a sound argument against this amendment can be based. It does not propose to lessen in any way the power given to the Interstate Commerce Commission by the other provisions of the bill. It simply proposes to afford an alternative method by which the Commission may proceed if it or the complainant shall prefer. One of the strongest arguments that can be made in favor of the Foraker amendment is that, in the event of the rate-making feature of the Hepburn bill being found to be unconstitutional, as many lawyers believe it will be even if amended as proposed, the Foraker provision would still be left in force and would afford a most effective means for putting a stop to any unreasonable or exorbitant charges by the very summary process of injunction. The Foraker amendment, if adopted, will round out and complete the Elkins act.

J. C. W.

Ruling Grades on the Transcontinental Lines.

In the *Railroad Gazette* of June 30, 1893, profiles and tables of the ruling grades of the five so-called transcontinental lines were shown. An earnest effort was made this spring to correct this information to date, but it was only partially successful. We are enabled, however, through the courtesy of Mr. Julius Kruttschnitt and of Mr. W. L. Darling, to show the revised profiles of the Harriman lines and of the Northern Pacific. Revised tables of ruling grades on the Atchison, Topeka & Santa Fe and the Canadian Pacific were also furnished us by Messrs. James Dun and W. F. Tye. The vital facts for each of the transcontinental lines now existing, except the Great Northern, are therefore printed below. The new lines to the coast, the Western Pacific-Denver & Rio Grande-Missouri Pacific route and the Chicago, Milwaukee & St. Paul, replied that the information, in the form in which we requested it, was not yet available.

For purposes of comparison, the profiles of 1893 and some of the grade tables are reprinted.

Atchison, Topeka & Santa Fe; Ruling Grades in 1893.

From	Elevation, ft.	To	Elevation, ft.	Miles	Maximum grade, West, East, ft. ft.	Total ascent (approx.) West, East, ft. ft.
Chicago	593	Kansas City	750	458	58 79	4,111 3,954
Kansas City	750	La Junta	4,061	571	63 61	5,197 1,886
La Junta	4,061	Albuquerque	4,950	348	185 175	8,440 7,551
Albuquerque	4,950	Winslow	4,848	285	53 53	2,930 3,032
Winslow	4,848	The Needles	477	290	75 137	5,307 9,678
The Needles	477	San Bernardino	1,075	250	87 158	6,163 5,565
San Bernardino	1,075	National City	10	192	116 116	1,855 2,920

Chicago	593	National City	10	2,394	185 175	34,003 34,586
Kansas City	750	National City	10	1,936	29,892 30,632

Atchison, Topeka & Santa Fe; Ruling Grades in 1906.

From	Elevation, ft.	To	Elevation, ft.	Miles	Maximum grade, West, East, ft. ft.	Total ascent (approx.) West, East, ft. ft.
Chicago	593	Kansas City	750	458	58 53	4,088 3,931
Kansas City	750	La Junta	4,061	571	56 34	4,760 1,449
La Junta	4,061	Albuquerque	4,950	348	185 175	8,440 7,551
Albuquerque	4,950	Gallup	6,498	158	53 53	2,848 1,390
Gallup	6,498	Winslow	4,848	128	16 32	82 1,732
Winslow	4,848	Needles	477	292	75 137	5,307 9,678
Needles	477	San Bernardino	1,075	250	87 158	6,163 5,565
San Bernardino	1,075	National City	10	192	116 116	1,855 2,920

Albuquerque	4,950	National City	10	1,020	116 158	16,255 21,195
Chicago	593	National City	10	2,382	185 175	33,543 34,126

Northern Pacific; Ruling Grades of 1906.

St. Paul	732	Glendive	2,091	665	53 53	5,749 4,355
Glendive	2,091	Livingston	2,091	341	26 26	2,727 525
Livingston	2,091	Helena	3,955	123	116 100	1,786 2,304
Helena	3,955	Trout Creek	2,378	250	116 116	1,916 4,519
Trout Creek	2,378	Ellensburg	1,518	404	53 53	4,065 3,815
Ellensburg	1,518	Tacoma	12	125	116 116	1,400 2,819

St. Paul	732	Tacoma	12	1,908	116 116	17,643 18,337
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Canadian Pacific; Ruling Grades of 1906.

St. John	17	Montreal	128	483	63 63	7,598 7,487
Montreal	128	Fort William	616	991	53 53	10,926 10,438
Fort William	616	Winnipeg	743	426	53 21	5,349 3,219
Winnipeg	743	Broadview	1,939	267	21 21	2,150 957
Broadview	1,939	Moose Jaw	1,754	135	53 21	1,110 1,295
Moose Jaw	1,754	Medicine Hat	2,153	260	53 53	2,673 2,274
Medicine Hat	2,153	Laggan	5,037	297	40 40	4,185 1,301
Laggan	5,037	Revelstoke	1,498	146	116 116	2,678 6,217
Revelstoke	1,498	Vancouver	11	380	66 53	3,632 5,119

St. John	17	Vancouver	11	3,384	116 116	38,301 38,307
Montreal	128	Vancouver	11	2,901	116 116	30,703 30,820
Montreal	128	Winnipeg	743	1,417	53 53	14,275 13,657
Winnipeg	743	Vancouver	11	1,484	116 116	16,428 17,163

*Via Smiths Falls.

†A 4.58% grade (242 ft. to the mile) between Hector and Field; pusher used.

Southern Pacific; Ruling Grades in 1906.

From	Elevation, ft.	To	Elevation, ft.	Miles	Maximum grade, West, East, ft. ft.	Total ascent (approx.) West, East, ft. ft.
Algers	8	Morgan City	74	81	20 16	45 31
Morgan City	74	Lafayette	39	64	19 19	91 79
Lafayette	39	Echo	16	107	19 16	84 113
Echo	16	Houston	58	110	52 45	233 201
Houston	58	Glidden	233	87	52 52	308 139
Glidden	233	San Antonio	661	122	52 52	2,046 1,562
San Antonio	661	Del Rio	976	169	52 52	1,887 1,623
Del Rio	976	Sanderson	2,772	137	52 52	2,994 1,200
Sanderson	2,772	Valentine	4,427	152	52 52	3,169 1,655
Valentine	4,427	El Paso	3,724	161	52 52	1,227 2,017
El Paso	3,724	Lordsburg	4,245	148	53 53	1,428 903
Lordsburg	4,245	Tucson	2,390	164	74 74	2,148 4,003
Tucson	2,390	Gila	736	128	48 53	990 3,243
Gila	736	Yuma	137	123	53 53	1,292 753
Yuma	137	Palm Springs	676	142	53 53	1,898 1,612
Palm Springs	676	Colton	962	49	103 104	395 1,066
Colton	962	Los Angeles	291	57	66 64	1,254 1,543
Los Angeles	291	San Barbara	2	103	53 53	1,080 1,145
San Barbara	2	S. Luis Obispo	237	117	117 117	1,103 345
S. Luis Obispo	237	S. Margarita	43	118	.. 37	477 1,429
S. Margarita	43	Salinas	12	118	32 55	947 978

New Orleans	..	San Francisco	..	2,474	117 117	25,995 26,221
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Omaha to Portland; Ruling Grades in 1893.

Omaha	1,031	Cheyenne	6,050	516	66 40	5,312 293
Cheyenne	6,050	Laramie	7,149	57	80 91	2,197 1,098
Laramie	7,149	Granger	6,279	303	66 63	2,302 3,172
Granger	6,279	Tieska	3,087	358	66 79	1,306 4,498
Tieska	3,087	Reverse	3,084	36	106 90	552 555
Reverse	3,084	Huntington	2,112	147	26 26	184 1,156
Huntington	2,112	Pendleton Junc.	1,101	173	116 105	3,736 4,747
Pendleton Junc.	1,101	Portland	..	35	232 74	850 1,916

Omaha	1,031	Portland	..	1,822	116 105	16,439 17,435
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Omaha to Portland; Ruling Grades in 1906.

From	Elevation, ft.	To	Elevation, ft.	Miles	Maximum grade, West, East, ft. ft.	Total ascent (approx.) West, East, ft. ft.
Omaha	1,035	Cheyenne	6,058	516	66 40	5,399 376
Cheyenne	6,058	Laramie	7,145	57	82 43	2,021 934
Laramie	7,145	Granger	6,281	281	43 43	2,652 3,516
Granger	6,281	Tieska	3,089	358	44 79	1,586 4,778
Tieska	3,089	Reverse	3,089	36	106 90	631 631
Reverse	3,089	Huntington	2,112	147	26 26	296 1,273
Huntington	2,112	Pendleton Junc.	1,101	173	116 106	3,736 4,747
Pendleton Junc.	1,101	Portland	..	35	232 26	850 1,916

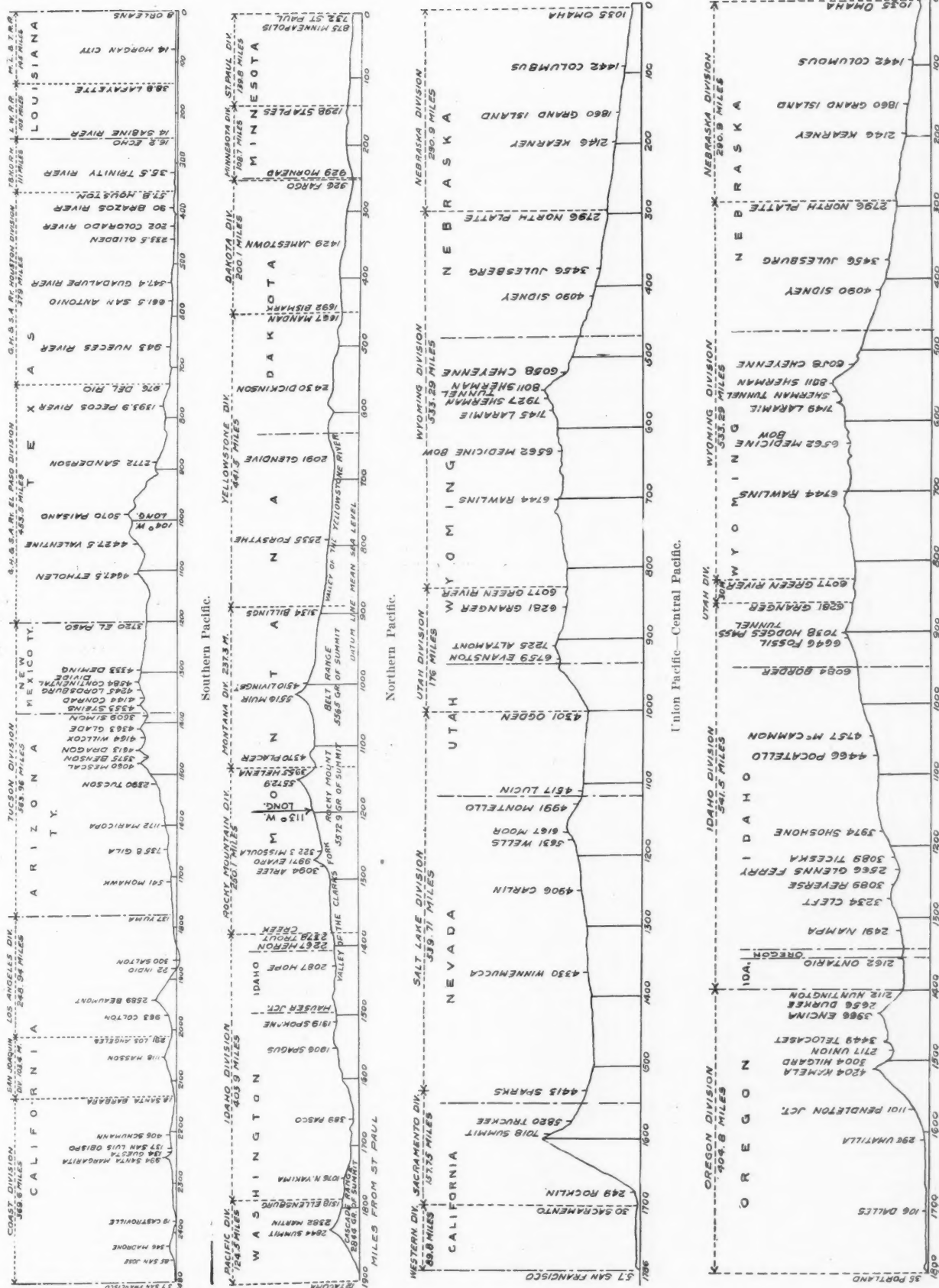
Omaha	1,035	Portland	..	1,800	116 106	17,171 18,171
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Omaha to San Francisco; Ruling Grades in 1906.

From	Elevation, ft.	To	Elevation, ft.	Miles	Maximum grade, West, East, ft. ft.	Total ascent (approx.) West, East, ft. ft.
Omaha	1,035	Cheyenne	6,058	516	66 40	5,399 376
Cheyenne	6,058	Laramie	7,145	57	82 43	2,021 934
Laramie	7,145	Green River	6,077	251	43 43	2,186 3,234
Green River	6,077	Wahsatch	6,824	111	43 43	1,406 659
Wahsatch	6,824	Ogden	4,301	65	.. 96	.. 2,523
Ogden	4,301	Lucin	4,517	102	21 21	370 154
Lucin	4,517	Wells	5,631	72	75 75	1,836 722
Wells	5,631	Sparks	4,413	367	21 21	1,473 2,691
Sparks	4,413	Truckee	5,820	35	8 ..	1,413 6
Truckee	5,820	Rocklin	250	97	105 116	1,227 6,797
Rocklin	250	Sacramento	30	22	79 ..	85 255
Sacramento	30	San Francisco	12	90	52 21	186 204

Omaha	1,035	San Francisco	12	1,787	105 116	17,552 18,575
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The Chicago Subway.

The *Boston News Bureau* publishes the following comments on the Chicago freight subway:

The Chicago Subway is not a railroad line. It is built to transport freight between railroads, and yet has no railroad connection, so far as its rails are concerned. It is a lighterage or teaming proposition. Of the railroad mileage of the country, 40 per cent. terminates in Chicago. More than one-fourth of the valuable congested business section of the city is given up to railroad terminals and freight yards. Under the Chicago Subway plan the whole business section of the city between the lake front and the rivers, and also underneath the rivers and beyond north and west, is treated as a freight yard, 12 tracks under the 12 parallel streets running north and south and 16 tracks running east and west. The terminals for this underground freight yard are furnished by the sub-basements of the buildings and blocks, so far as they make connection with the subway, and by the space as appropriated underneath the railroad terminals. Congestion in such a freight yard is practically impossible, for at every intersection of the tracks are four switches and cut-off loops, as well as telephone connection. In addition the spaces under the sidewalks are reserved for sidings. Therefore, the 44 miles of tunnel may gradually become three times this amount of track beneath the streets, and an indefinite amount of track within stores and buildings, for the small cars that have been adopted may not only be rapidly whisked in and out of sub-basements, but elevated to higher basements or to wholesale departments or storage rooms upon any floor of a building. Thus every merchandise building in this part of Chicago may become a limitless railroad terminal. The small units of cars and the 2-ft. railroad gage were adopted in order that the central lines of the streets might be followed and every street corner turned, and also that the space under the sidewalks might be reserved for sidings from which elevators might lift the cars to the basement floor. But the rapidity with which Chicago is building down to the subway, 40 feet below the street, has shown the greater utility of placing the elevator system within the building.

When, many months ago, Marshall Field learned that somebody was tunneling below his block in Chicago he declared his intention of getting a court injunction against such work. The answer was: "You are too late, Mr. Field. The work about your building was finished long ago." Then Mr. Field was invited down to visit the streets of a city he had but recently learned about. As he read the brass signs on the street corners below he exclaimed: "So this is my first view of my own corner underground. Can I see the other three corners?" In a few minutes he had been upon a tour of inspection about the other three corners and around his own block. Mr. Field stood and looked down the long alley, through whitewashed and electrically lighted walls relieved in color only by the lead pipes filling the arched roofs and carrying hundreds of miles of telephone cables connecting the 8,000 or 10,000 subscribers to the Chicago Automatic Telephone system. He reflected for a few minutes and then exclaimed: "Well, it was fortunate I did not know what you were doing down here, for I certainly would have fought you in the courts. Real estate may be as valuable under ground as above ground. You need not bother to build elevators under our sidewalk. I will meet you more than half way. I will come down to your level with the entire building."

Already 27 buildings are building down at the expense of more than \$3,000,000 to a level with the subway. To build up from the subway and instal the elevator system and connection beneath the sidewalk takes only about two weeks. Nearly 30 such connections are already in, and 40 more have been ordered. Applications for these connections are coming in daily. The making of additional basement floors beneath the buildings is a matter of larger moment, but in this case the subway has the hauling of the material from the excavation and this point serves to illustrate the possibility of subway earnings and the point that its competition is with horses and not with steam locomotives.

At the present time, when new buildings are built in this district in Chicago, connection is made with the subway and the old building is taken down from within. Its debris and the soil below disappear through the subway. In taking the dirt from beneath the building of Marshall Field & Co., 1,500 cu. yds. of dirt per day was the work of one little electric locomotive and six cars, as contrasted with the possibility of 300 cu. yds. per day that could have been removed by horses. While the horses would have occupied space and stood idle, the electric locomotive pulled three cars, or 15 cu. yds. of dirt out to the lake front dumping ground, while the three other cars were loading, and that was all it had to do—simply throw three empties upon one track and take out three full cars on the other. The price was the teaming price of 60 cents a yard, which meant \$900 per day for the earnings of that locomotive and its engineer, at a cost of wages, oil, waste and power, as near as could be figured, of \$5.50 per day. Of course, the balance of the cost is the interest on the cost of the subway.

The figures look ridiculous, but they are vouchsafed for by one or the engineers in charge. They are no more ridiculous than those for transportation between the Chicago & Alton terminals and the First National Bank building. The Chicago & Alton hauls soft coal 162 miles and dumps it through a subway funnel into the subway cars for 50 cents per ton. The subway, by actual timing, recently received this coal in the delivery time of one minute and 20 seconds, and in 18 minutes thereafter it delivered it into the coal hole of the First National Bank building. The subway received the same price for 20 minutes' work and less than a mile haul that the Alton road received for its 162-mile haul, and the bank got in its coal without dust or dirt, horses or teamsters or labor, within or without its building.

The subway is dry and sweet, with an even temperature of about 58 deg. and perfectly ventilated. When the problem of ventilation appeared the management did not send for sanitary engineers or experts on ventilation, but sent a man through the district to inquire what basement boilers had poor drafts. Then to the owners of such boilers was offered a draft of air from below. The result was magical. Poor furnaces and bad chimneys quickly became economical, and the demand for subway air was such that it has since had to be systematically regulated. The ventilation problem was solved without expense to the subway.

The Chicago Subway has as many tunnels under the Chicago river as there are bridges. There are five bridges over the river and five subway tunnels underneath. Over the south branch of the Chicago river there are 10 bridges and underneath, the Chicago subway has seven tunnels. Over the north branch of the Chicago river there are four bridges and underneath, the subway has two tunnels. This is a total of 14 tunnels to 19 bridges. There were no dedicatory services, opening ceremonials, brass bands or headlines in the newspapers announcing the completion of these tunnels, and they are purposely without date, for they were building without public knowledge or inspection, every hour of the day, whether Chicago was asleep or awake, and they were built as every other part of the tunnels were built—with telephone connection from the breast of the work, not only to working desks, but to the bed-sides of the engineers in charge. The directions were emphatic that if anything was struck besides clay formation, unusual or not understood, not another movement forward was to be made until it had been referred back up the line of supervision for authoritative consideration. If the foreman did not understand it, the matter went to the local engineer; and if not understood there, it went further up the staff and to a Chief Engineer with a salary larger than that of the President of the United States. Thus the Chicago Subway was built, without crash, accident or flood. Nevertheless, there are automatic pumps, at regular intervals, which remove drainage or water as automatically as the flues to the boilers above cleanse the atmosphere. The first seven miles of the Chicago Subway were finished before the newspapers of Chicago knew of the existence of such an enterprise, and yet the record of every day's work was properly and legally placed on file at the City Hall. At times the subway construction has been in progress days and nights with the maximum number of men that could be worked under every street, and at other times, awaiting some necessary franchise or legal action, the subway work has been shut down for many months, and at both times during the past six years, the management has been as unresponsive to the demand for public information as it has been to demand from its stockholders for information. The policy has been that one man could pilot a work so dangerous and difficult but that more could not.

Terminal connections have purposely been kept in the background for the reason that up to within a few months it has not been deemed best to permit the extent of the work to be known. No terminal connections were desired until the 44 miles of tunnel were completed and ready for full operation. One of the most roomy tunnel installations with Chicago Subway is beneath the post office. It has double tracks, high arches, automatic delivery system, by endless belt line—all installed in working order and awaiting only government red tape on minor details of contract relations. In a few weeks not only the newspapers of Chicago, but all the mail from the railroads, will pass to the post office through the Chicago Subway, saving the great delays of the teaming transportation system. It is expected that by June 1st connections with the railroads will be completed and opened for business. At that time 54 connections with mercantile houses will have been installed.

It is figured that by August 1 there will be moving through the subway 30,000 tons of merchandise every 24 hours. None of this will pay less than 50 cents per ton, and if the average rate is 60 cents per ton and the estimates are based upon 365 days, the gross income from this source alone should be \$6,500,000 and the net income from this should be not less than \$5,000,000.

The subway can be operated very cheaply, day and night, and in all weather; the rates are teaming rates and not railroad freight rates, and the percentage of cost as applied to gross earn-

ings in railroad operations in no way applies to this enterprise. It is electric power on a clear right of way and on a level as against oats, horses and men in the most congested teaming district in the world, where teaming has practically reached its daytime limit with a gross annual expense of \$65,000,000. So dense has the traffic in this section of Chicago become that for the most part teams can no longer be hired on a trip or tonnage basis. They must be engaged by the day, for no man can tell what progress teams can make through the city. Of the estimated \$5,000,000 for annual net earnings of the subway at least \$1,000,000 must be deducted for interest on the \$20,000,000 indebtedness and what remains is the earnings upon \$40,000,000 of stock, provided the capitalization remains as at present. That an estimate of 30,000 tons per day is not excessive is indicated by the fact that 11,000 tons in less than carload lots goes at 60 cents per ton between the railroads every day, and this business only awaits the completion of the subway terminals under the railroads. Two thousand tons of express matter goes between stations daily by wagons. It is further figured that one-third of the goods now teamed through this section of the city at an expense to the merchants of more than \$60,000,000 a year, will in 1907 pass through the subway. This means gross earnings of \$20,000,000. On this basis, the estimates are \$12,000,000 for net earnings, but it will be very difficult to find a basis for \$8,000,000 of expense, as the subway does not do the loading or unloading of the cars. The goods are received in the cars and the cars are delivered for unloading in the stores or for automatic unloading as in the case of coal.

Three New Railroad Shop Tools.

The accompanying illustrations show three new railroad shop tools which are just being put on the market by the Niles-Bement-Pond Company, New York. Figure 1 shows a new hydraulic wheel press which embodies a number of new and valuable features. To facilitate the handling of heavy work with an overhead crane

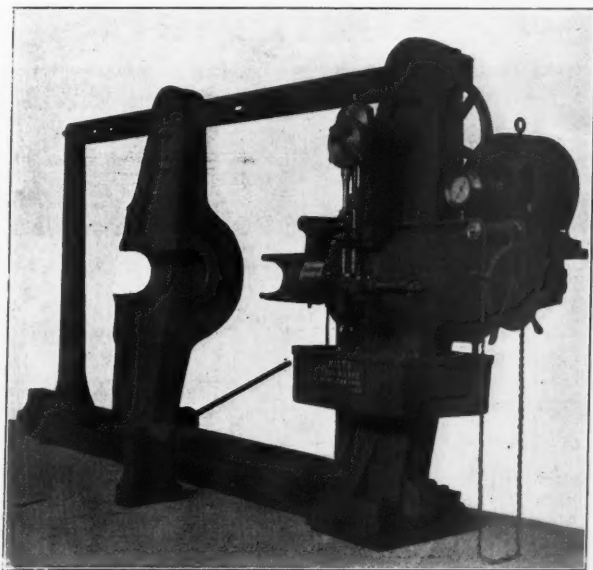


Fig. 1—Niles-Bement-Pond 300-Ton Hydraulic Wheel Press.

the cylinder and resistance head of the press are set over in order that the top tie bar may not interfere with the hook of the crane. This press has a capacity of 300 tons, and it is driven by a 7½-h.p. motor. The maximum distance between the ram and the sliding-head is 8 ft. 4 in. It will handle wheels up to 72 in. in diameter on the tread, and the distance between the tie-bars is 78 in. The machine is mounted on a base-plate, but no strains are transmitted to it as all pressure is taken by the tie-bars. The cylinder is lined with copper expanded into place and burnished. The piston is packed with best cup-leather; is tight, durable, and causes little friction. The pump is double-acting. It has two sizes of plungers and three speeds of delivery, any one or all of which are under instant control. The delivery may be instantly stopped by trip-valves without shifting the belt. The ram is counterweighted for quick return when the release-valve is opened. The safety-valve can be set to open at a desired pressure and is protected from tampering by a lock-box. The pressure-gage is graduated for tons of pressure and for lbs. per sq. in. on the ram. A water-tank is bolted under the cylinder and takes the discharge and supplies the pump. The sliding-head is held in position by large steel keys and is supported by rollers running on planed ways on the base and also by rollers on the lower tie-bar.

Figure 2 shows a new design of locomotive rod-boring machine, built at the Niles Works. It will bore rods from 36 in. to 10 ft. between centers, and holes from 3 in. to 7 in. in diameter. The spindles are driven by tangent gearing, giving a smooth motion under heavy cuts. Each spindle is driven by a 7-h.p. motor, so that the spindles are entirely independent and may be run at different speeds. They are counterweighted, have power feeds, controlled by pull pins, hand feeds and quick hand return. The heads are movable on the rail by rack and pinion, and have clamps for fixing position. The work table is 20 in. x 11 ft. 10 in., and

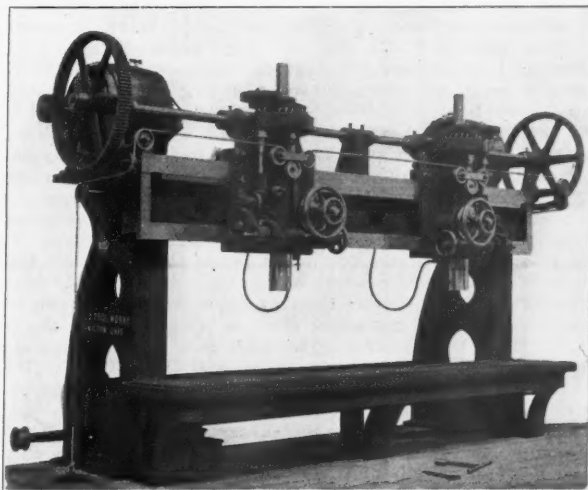


Fig. 2—Niles-Bement-Pond Locomotive Rod Boring Machine.

the maximum distance from the table to the spindles is 15 in. The overhang in front of the housings is 10 in., and the down feed is 14 in. This is a most efficient machine for the purpose intended and will do a variety of other boring also. An ingenious arrangement for lubricating is provided consisting of a circulating pump which forces the lubricant into a pipe placed back of the rail from which it is fed to the boring spindles by means of flexible pipe connections.

Figure 3 shows a 79-in. standard wheel lathe designed by the Niles-Bement-Pond Company for railroads not requiring a machine of the capacity of its heavy driving wheel chucking lathes. This machine is fitted with "sure-grip" drivers, which engage the tires directly and hold them absolutely rigid under the heaviest cuts, allowing the full power of the machine to be used at the tools. The face plates, as in the larger machines, have holes for the

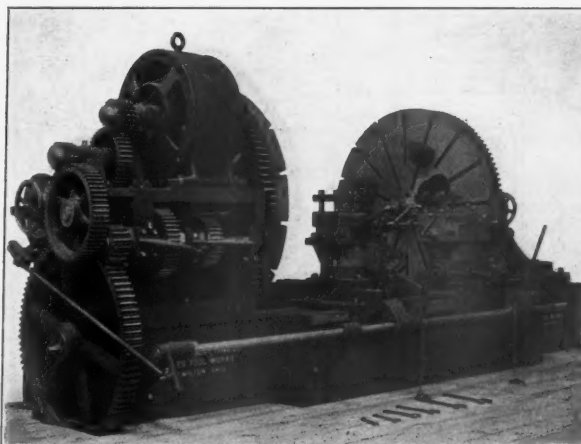


Fig. 3—Niles-Bement-Pond 79-in. Standard Driving Wheel Lathe.

reception of the crank pins, enabling the tires to be chucked close to the face plates. The tool-rests are of massive design and the feed mechanism is operated by a rocker shaft at the front.

The dimensions of this lathe are: Swing-over bed, 80 in.; diameter of face-plates, 79 in.; distance between face-plates, minimum, 6 ft. 6 in.; maximum, 9 ft. If motor driven, a 20-h.p. motor is used.

The Belgian State Railroads have let contracts for 177 locomotives to various works in the country at prices as follows: Twelve-wheeled engines with superheater, 50 at \$15,180 each; 76 similar

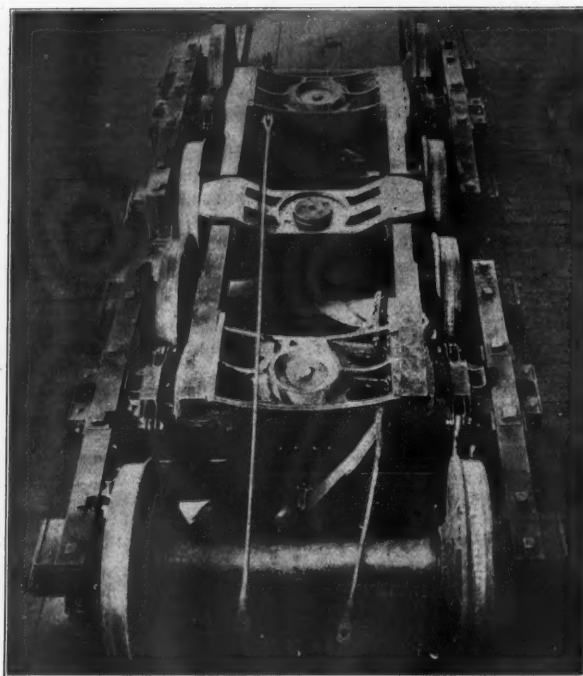
engines, but without superheater, \$14,395; 30 16-wheeled tank engines, \$16,723; 21 eight-wheeled tank engines, \$16,257 each.

100-Ton Flat Cars for Allis-Chalmers Company.

Two 200,000-lbs. capacity flat cars, intended for the special purpose of carrying heavy engine shipments, have been built at the West Milwaukee shops of the Chicago, Milwaukee & St. Paul for the Allis-Chalmers Company. Drawings and photographs of the design are shown herewith.

The car is 39 ft. 6 in. long back to back of end sill channels, 8 ft. wide center to center of side sill webs, and 9 ft. 8 3/4 in. wide over all. The center and side sills are 15-in., 100-lb. I-beams, and the transverse members are 8-in., 21 1/4-lb. channels spaced 3 ft. 7 in., riveted to center and side sill webs. Between center sills, similarly spaced, are 1-in. x 8-in. plates bent to rivet to the sill webs. The end sills are 15-in., 55-lb. channels. Each corner of the frame is reinforced by a 1/2-in. plate 1 ft. 6 in. wide riveted to the top flanges of the end and side sills. Oak nailing pieces 4 in. x 4 in. are bolted to the transverse channels, three on each side of the center sills. As shown in one of the sections and in the plan, the double body bolster is formed from heavy plates, with the principal members passing respectively above and below the center sill flanges, and their ends riveted together and to the side sill webs. Suitable stiffening members and side bearings are provided, as shown in the cross-section. All of the plates are 1 in. x 10 in. except the lower one, which is 1 1/2 in. thick. The draft gear is equipped with the Harvey friction spring, Class D, 6 1/4 in. x 8 in.

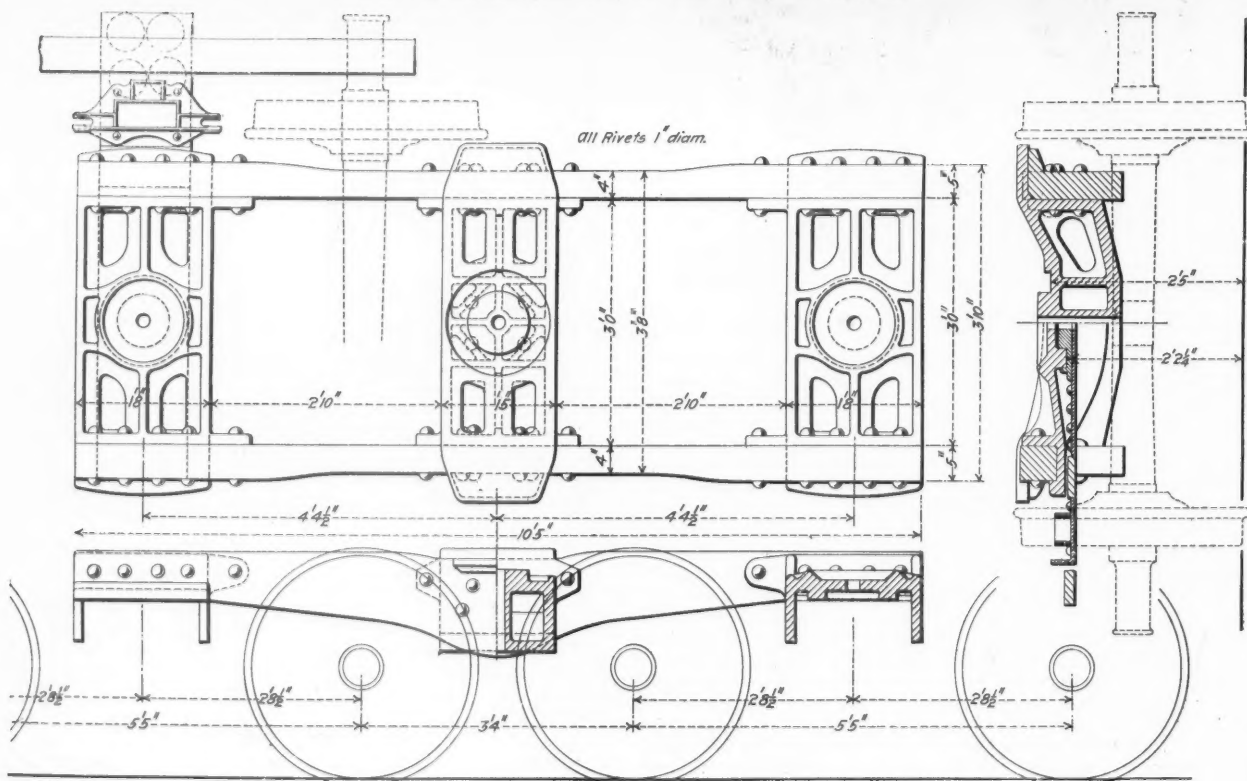
Interest in the design centers in the truck arrangement. The body is carried by a cradle swung between two 100,000-lb. capacity Barber trucks. The two longitudinal members or equalizer bars of this cradle are hammered iron. The cradle center bearing and two truck bearings are cast-steel and are riveted to the equalizer bars



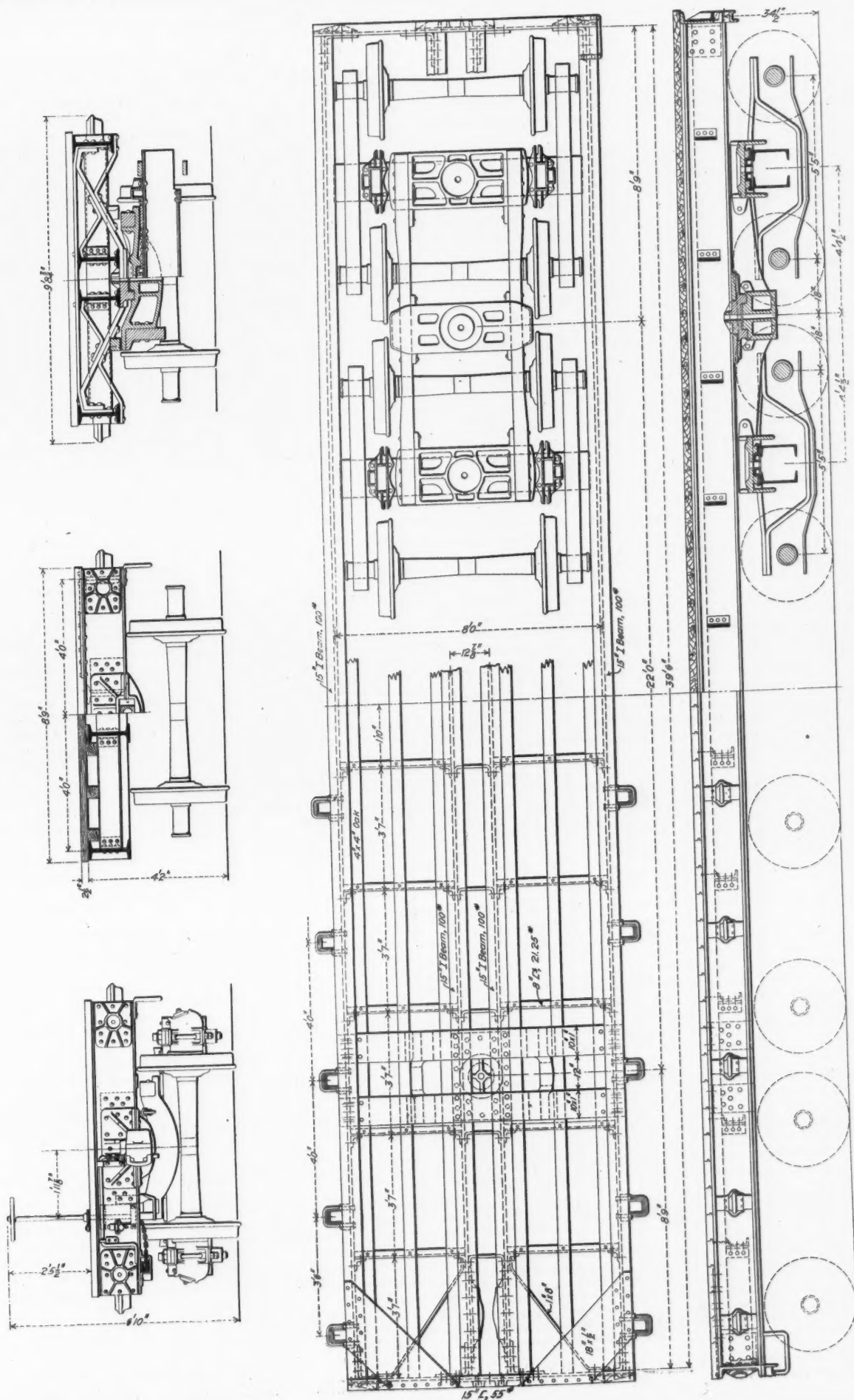
Cradle for 100-Ton Flat Car—Allis-Chalmers Company.



100-Ton Capacity Car for the Allis-Chalmers Company.



Cradle for 100-Ton Car—Allis-Chalmers Company.



General Plan, Half, Side Elevation and Cross Sections—100-Ton Flat Car for the Allis-Chalmers Company.

with 1 in. rivets. One of the cars was tried on a 16-deg. curve and took it without difficulty. It is expected they will go where any ordinary car will. The trucks are M. C. B. standard, so that axles, bearings, wheels, etc., can be replaced readily anywhere in interchange territory.

The car was designed by J. F. DeVoy, Mechanical Engineer of the Chicago, Milwaukee & St. Paul, under the supervision of A. E. Manchester, Superintendent of Motive Power, and J. J. Hennessey, Master Car Builder.

Canadian Railroad Notes.

OTTAWA, April 30.—The Ontario Government's railway tax bill was introduced in the Legislature last week. The principle of the bill is taxation according to mileage. In organized territory, railways will pay \$60 per mile of single track, and \$20 a mile for each additional track. In unorganized territory the rates will be \$40 and \$10 respectively. The rates for roads less than 150 miles long will be \$15 for single track and \$5 for each additional track. In view of the early replacing of steam by electricity in Ontario, the government proposes to tax electric roads of over 150 miles, running on their own right-of-way, the same as steam lines. Thus if the Grand Trunk installs electric locomotives it will continue to pay the same tax. Rural electric lines are to be taxed \$10 a mile on each track. There will be no tax on city street railways. The increase in revenue from this source will amount to about \$200,000.

The transportation interests were on hand last week in full force to point out the injustice that would be done them by the passage of the government's Sunday observance law in its present form. General Manager McNicholl, of the Canadian Pacific, was the first witness before the committee. He strongly objected to the canceling of Sunday trains and showed why public necessity opposed it. His statements were corroborated by Mr. F. H. McGuigan, Vice-President of the Grand Trunk. Representatives of the trainmen also opposed the measure as involving extra work on Monday and in no way lessening the labor of freight handlers, etc. The steamship companies' representatives also were hostile to the bill.

The first bill taken up by the railway committee Friday was that authorizing the Grand Trunk Pacific to issue debenture stock to the amount of \$25,000,000. The Minister of Justice explained that the issue would not interfere with the security of the government. The money would be used by the company to purchase rolling stock upon which the government would hold a lien. The clause authorizing the company to guarantee the bonds of the Grand Trunk Pacific Branch Lines Co. caused considerable discussion. Mr. Emmerson, Minister of Railways, suggested that any such guarantee should be subject, to approval by the Governor-in-Council. The bill was finally reported with the amendment suggested by the Minister of Railways.

The bill to incorporate the Grand Trunk Pacific Branch Lines Company was next taken up. The capital stock is placed at \$50,000,000. Twenty-two branch lines from different points of the G. T. P. are mentioned as feeders to the main line. J. A. M.

The Revised Standard Code.

The Train Rules Committee of the American Railway Association has, during the past year, made a comprehensive revision of the Standard Code of Train Rules, having held sessions which covered in all 15 days; and the revision, as reported by the committee, was adopted by the association at its meeting in Chicago last week. The principal changes made by the committee are noted below. In this work the committee has been aided by the following train despatchers: F. G. Sherman (C. of N. J.), W. H. Graves (C. & N.-W.), J. F. Mackie (C., R. I. & P.), and H. M. Tompkins (L. S. & M. S.).

General rule G, second sentence, refers to the use [at any time], not the habitual use, of intoxicants. Rule K refers to "patrons" instead of passengers.

The definition of a regular train is "a train authorized by a time-table schedule." A main track is "a track extending through yards and between stations, upon which trains are operated by time-table, or train order, or the use of which is controlled by block signals."

Rule 2 provides for the inspection of the watches of other classes than conductors and enginemen. Rule 4 A is omitted and the single form for Rule 4 reads:

Each time-table, from the moment it takes effect, supersedes the preceding time-table, and its schedules take effect on any division (or subdivision) at the leaving time at their initial stations on such division (or subdivision). But when a schedule of the preceding time-table corresponds in number, class, day of leaving, direction, and initial and terminal stations with a schedule of the new time-table, a train authorized by the preceding time-table will retain its train orders and assume the schedule of the corresponding number of the new time-table.

Schedules on each division (or subdivision) date from their initial stations on such division (or subdivision).

Not more than one schedule of the same number and day shall be in effect on any division (or subdivision).

The new code prescribes the use in time-tables of a capital L for leave and a capital A for arrive. Rule 12c prescribes a circle "at half arm's length"; in 12e the signal is to be given above the head. Under rule 14h, three short blasts of the whistle will be used, when a train is running, to answer 16d. The title for rule 16 is "Communicating signals," which does not seem to be much of an improvement. In rule 20 the words "of a train" are omitted, and rule 22 omits "to a train."

Following rule 23, the next title is "Superiority of trains," and the first rule, No. 71, contains the paragraphs about right and superiority which formerly were contained in the definition of "superior train." Rule 81 is made No. 72 and there are other slight changes under this head. Rule 82 reads:

Time-table schedules, unless fulfilled, are in effect for twelve hours after their time at each station.

Regular trains twelve hours behind either their schedule arriving or leaving time at any station lose both right and schedule, and can thereafter proceed only as authorized by train order.

Rule 87 is changed to 86, and reads:

An inferior train must clear the time of a superior train in the same direction, not less than five minutes, but must be clear at the time a first-class train, in the same direction, is due to leave the next station in the rear where time is shown.

The last clause, it will be observed, lengthens the time interval where the next station in the rear is far away, but never shortens it to less than five minutes. Rule 88 provides specifically for extra trains and continues to require trains to pull into sidings instead of being pulled in by the locomotive.

Rule 93 has been included in Rule 85, in improved language, and a new rule numbered 93 reads: "Within yard limits the main track may be used, protecting against ——— class trains.

———— class and extra trains must move within yard limits prepared to stop unless the main track is seen or known to be clear."

Rule 94 has a new paragraph added permitting a train which loses its right of track to go to the next telegraph station ahead of and on the right of another train which overtakes it.

Rule 96 requires the arrangement with the operator to be made in writing. In rule 101 the directions as to keeping the engine in motion and telling how to go back are omitted.

Rule 207 requires the despatcher to say what direction he refers to; as, for example, "31 West, copy 5." Rule 208 is made 208A, and a new rule, 208B, provides for sending the order to the operator at the meeting or waiting point. Rule 209 has a note requiring that when additional copies of an order are made on a typewriter, the new copies must be telegraphed to the train despatcher. Rule 211 permits an operator to send orders to enginemen rather than go far away from his office. When a "19" order restricts the superiority of a train at the station where delivered, the train must be stopped before the order is delivered. Rule 218 reads: "When a train is named in a train order by its schedule number alone, all sections of that schedule are included, and each must have copies delivered to it." Rule 219 requires the operator to get the signatures of the conductor and engineman. Rule 220, second paragraph, applies not only to orders but to parts of orders.

Rule 221B provides for east and west, corresponding with the provision in Rule 207.

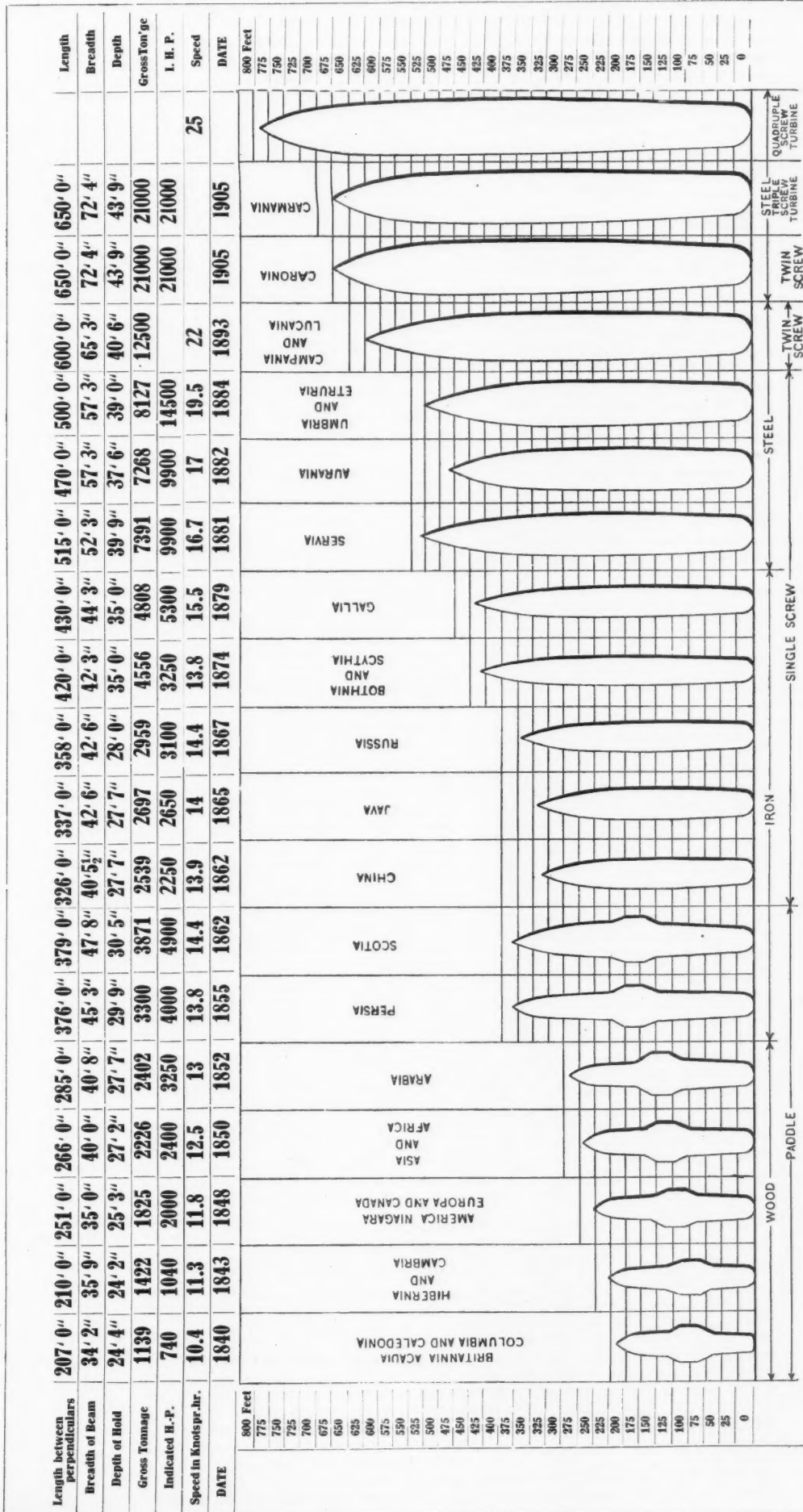
In the forms of train orders a large number of changes have been made. In all of the forms the supposed stations are represented by letters of the alphabet and not by names of towns on the other side of the globe; for example, old form A 5 read: "No. 5 will meet Extra 95 at Hong Kong." The new form reads, "No. 5 meet Extra 95 east at B." Form D is omitted. Under form F, nine examples are given. Under forms L and M the rule following the example is omitted.

All of the foregoing refers to the rules for single track. Following this code is the code of rules for double track. This in nearly all of its features is the same as the code for single track, those rules which are necessary only on single track being omitted. The blank forms, 31 and 19, are not changed, but the clearance card is changed a trifle.

Increase in Size of Ocean Steamships.

The following diagram was prepared by Mr. Elmer L. Corthell to show the increases in size of the vessels of the Cunard fleet from the foundation of the line, in 1840, until the present day. It was published as part of a report to the Permanent International Association of Navigation Congresses. In the same report, Mr. Corthell shows the average length and gross tonnage of the 20 largest steamships, as follows:

Average Length, 20 Largest Steamships.			
1848.....	230 ft.	1891.....	507 ft.
1873.....	390 "	1898.....	541 "
1881.....	460 "	1903.....	640 "
Average Gross Tonnage, 20 Largest Steamships.			
1848.....	1,430	1881.....	4,900
1873.....	4,413	1891.....	6,977
		1898.....	10,717
		1903.....	17,151



The lengths of the steamers shown on this diagram are taken from taffrail to fore edge of stem.

Comparative Size of Cunard Mail Steamers from 1840 to 1905.

Actual Efficiency of a Modern Locomotive.

At the February meeting of the Pacific Coast Railway Club, Mr. Wm. P. Evans, of the Baldwin Locomotive Works, read a paper on locomotive efficiency, in which he made careful and detailed comparisons of the efficiency of the modern large locomotive with the lighter ones of 20 years ago. These comparisons were based:

1. On the theoretical efficiencies.
2. The first cost.
3. The interest on the investment.
4. Depreciation in value.
5. Cost of fuel consumed.
6. Cost of supplies consumed.
7. Hauling capacity.
8. Cost per ton-mile.
9. Reliability of service.
10. Time lost in shop repairs.

I. THEORETICAL EFFICIENCY.

The comparison will be based on coal and water per horse-power per hour. Any marked saving in this direction is to be found only by comparing single expansion engines with compound engines, or with those using superheated steam. The water rate of single expansion engines has not been improved to any appreciable extent since 1885.

At that time consolidation engines with cylinders 20 x 24 in. were in use. They had Stephenson valve gears, which were as well designed as to-day. The boilers with their narrow fireboxes did not evaporate quite as much water per pound of coal as is done now with wide fireboxes and longer boiler tubes. The theoretical advantages of compounding are familiar to all, but the results of a recent comparative test on the Chicago & Eastern Illinois between two 10-wheel freight engines, one a four-cylinder balanced compound weighing 191,060 lbs., and the other a single expansion engine weighing 185,800 lbs., will be of interest.

The average of seven tests on each shows:

	Compound.	Single expansion.
Water per horse-power per hour.....	29.20	34.12
Saving by compound in per cent. of water, 17 per cent.		

There also should be incidental economies resulting from the use of the balanced compound engines, as they should be free from frame breakages and much easier on the machinery as well as the rail due to the fact that the forces in these engines are perfectly balanced.

Superheated steam is comparatively new and still in the experimental state, but its advantages in reducing the water rate per horse-power are proven without question. The following results of tests made by the Canadian Pacific show what has been done in this line. The Schmidt fire tube superheater was used:

	Coal, per 1,000 ton miles.	Saving by superheat.
January to May, with superheater.....	129 lbs.	26.70 per cent.
Freight, without superheater.....	176 "	
June to September, with superheater.....	382 "	22.83 "
Passenger, without superheater.....	495 "	

In this connection there must be added a demand on the locomotive boiler for about 10 lbs. of coal per hour for each car in the train for heating; and, if electric lights are run by a dynamo driven by steam from the engine, this, as in the case of the Chicago & North-Western equipment, may call for 150 lbs. of coal more per car per hour.

Improvements in the valve-gear are continually being made the subject of experiment, but only two types, in this country, need be given serious thought—the Stephenson link-motion and the Walschaerts valve-motion. The Stephenson link was in general use 20 years ago and is the most common to-day, but in the last year the Walschaerts gear has been applied to a great many new engines. No economy is claimed for this year over the Stephenson, and its application is due to mechanical simplicity and reduced weight. No comparative tests have been made to my knowledge, so it may be assumed that no gain in the water rate is obtained.

II. RELATIVE WEIGHTS AND PRICES OF LOCOMOTIVES.

	1885			1905.		
	Weights.	Price.	Price per lb.	Weight.	Price.	Price per lb.
American	80,857	\$6,695	\$0.0828	102,200	\$9,410	\$0.092
Atlantic				187,200	15,750	.083
Mogul	72,800	6,662	.0912			
Pacific				227,000	15,830	.07
Ten wheeler	85,000	7,583	.0892	156,000	15,690	.088
Consolidation	92,400	7,888	.0854	192,460	14,500	.075

The price per pound is figured from the total weight of the engine with three gages of water in the boiler, but excluding the tender.

III. INTEREST ON INVESTMENT.

This figure is governed by the economic conditions of the country. At present the usual rate of interest is 4 per cent. In 1885 it was 5 to 6 per cent. Interest is therefore 1 to 2 per cent. lower than in 1885. The fluctuation between the two dates has been great, especially during the panic of 1893 to 1897.

IV. DEPRECIATION IN VALUE.

As soon as the engine goes into service, its value takes a sudden drop due to the fact that it then becomes a second-hand machine.

After this its depreciation is gradual until the cost of repairs and maintenance equals the service which can be obtained for it. Under average conditions prevailing in this country this occurs after a service of about 20 years when the curve of depreciation runs parallel to the base line.

It may be discussed systematically by dividing it into several principal headings.

1. The original cost of the locomotive and its present value. To the cost charged by the builder should be added the freight charge for delivery and the cost of breaking in the locomotive. The value of locomotives which have been in service a number of years, but which are in good working order, may be obtained approximately by obtaining the net weight of the locomotive proper, without tender, and without water in the boiler, and multiplying this weight by seven for the value of cents.

2. Depreciation must have some relation to the estimated life, but it is not necessarily a constant, as is often assumed. The common rule is to divide the original cost by the estimated life in years to find the yearly depreciation. A more rational method is based on the fact that after certain periods of service locomotives depreciate more rapidly. When this is taken account of, it is suggested that for the first five years the full second-hand value of the locomotive may be taken; for the second five years 85 per cent. of this second-hand value; for the third five years 70 per cent., and after 15 years 50 per cent. of the second-hand value; after 20 years 25 per cent. of the first cost.

V. DEPRECIATION.

Again the money invested in a locomotive may be treated as an amount of capital which is to be redeemed by an annuity in a certain period of years. For example, if the life of a locomotive is taken as 15 years and the interest at 6 per cent., we find in the annuity tables that the annual payment required to redeem \$1,000 in 15 years is approximately \$43, and for a locomotive costing \$10,000 the annual charge would be \$430, which is considerably less than the straight charge obtained by dividing \$10,000 by 15, which equals \$666.

This argument applied to engines in 1885 as well as 1905, except concerning the length of life of the engine. The actual life of a locomotive is a very uncertain thing to compute. An engine 38 years old was recently withdrawn from active service, having the original rods, frames, etc., and in England engines are said to be running in the neighborhood of 50 years old, and a Baldwin engine 60 years old is still in operation in Cuba.

Generally in this country when a locomotive is 20 years old it is supposed to have reached the limit beyond which it is not considered policy to spend much money for repairs, and if the same size and price of engine were purchased with which to replace it, an annual charge of 5 per cent. would create sufficient funds to effect a renewal at the end of the 20 year period.

In connection with the depreciation of locomotives, it is very properly maintained that it is best to keep engines in active service to as great an extent as possible so that they may be worn out and the benefits of new and improved forms be obtained. In short, it is very much better, if it be possible to so operate the road, to have, say, 50 engines which must be replaced in 10 years, than to have 100 stay in service for 20 years.

From what has been said it is plain that depreciation depends more on the service and use of the locomotive than the locomotive itself. Since engines 20 years ago were used more carefully and made fewer miles in a month than they do now, the rate of depreciation was much lower than to-day. In this respect the charges against an engine of 1885 would be less than for an engine of 1905.

As it has been impossible to get reliable data covering the past 20 years, that which it has been possible to gather for the years from 1897 to 1905 is given herewith:

1897 coal cost \$3.37	1900 coal cost \$3.12	1903 coal cost \$3.17
1898 " 3.20	1901 " 3.29	1904 " 3.26
1899 " 3.12	1902 " 3.14	1905 " 3.38

The introduction of oil has reduced the cost of this item on roads within reach of the oil supply.

An average figure for evaporation of water per pound of coal is 6¼. From the results of a number of tests made with fuel oil in California we may safely allow 10½ lbs. water per pound of oil.

Coal, \$3.38 per ton.	
Oil, ¾-cent gal., 8 lbs.	
168 gal. oil = 1 ton coal.	
Coal at \$3.38 a ton, or .169c. per lb.,	.169
	6¼
	.09375
Oil at ¾-cent gal. or .09375 per lb.,	10½
	.02704.
	.00892.

This makes a saving of 60 per cent. by the use of oil.

When the boilers are equipped with some form of superheater the evaporative rate for both oil and coal is lower, but they continue to bear about the same ratio.

This is due to the fact that some of the heat of the boiler is diverted from evaporating water to superheating the steam, and also because of the reduction of the heating surface effective for evaporating water. This is not true of the Vaucrain superheater, which is entirely in the smoke-box and utilizes the waste gases for

the same period for which the tonnage hauled was given, and shows the effect partially due to enlargement of trains. We say partial, as there are many other items besides the train loads which offset this cost, as the variation in price of materials, labor, etc. Such increases have occurred principally within the last five years, and it will be seen that generally the cost has risen in this period while it fell before. But we also see that the greatest increase in tonnage per train was made in the previous five years.

Average Cost of Transportation per Ton-Mile in Cents.											
Eastern.											
Lehigh Valley	1895	1896	1897	1898	1899	1900	1901	1902	1903	1904	
New York Central	.43	.42	.35	.40	.42	.41	.41	.43	.40		
Pennsylvania	.39	.35	.35	.38	.42	.44	.48				
Southern.											
Louisville & Nashville	.58	.54	.52	.54	.50	.51	.54	.55			
Norfolk & Western	.33	.28	.27	.26	.28	.27	.29	.31			
Chesapeake & Ohio	.28	.27	.24	.23	.22	.24	.25	.31			
Southern	.68	.65	.64	.63	.64	.66	.66	.70	.69		
Central.											
Illinois Central	.44	.44	.45	.43	.41	.40	.39	.43			
Chicago & N.-W.	.63	.60	.56	.54	.50	.51	.50	.55			
C. & M. & St. Paul	.67	.60	.61	.61	.59	.63	.57	.56	.58	.59	
L. S. & M. S.	.39	.37	.37	.34	.32	.33	.34	.38	.41		
Western.											
Southern Pacific	.62	.62	.64	.64	.66	.68					
Northern Pacific	.70	.50	.50	.47	.48	.46	.47	.46			
Great Northern	.51	.53	.44	.45	.46	.48	.42	.42	.46		

Examine, for instance, the record for the Northern Pacific, the cost dropped from .70 to .47 between 1897 and 1900, and the tonnage per train increased from 230 to 391 in the same time; whereas, from 1900 to 1904, the load has only increased from 391 to 403 (12 tons) and the cost has been reduced only one point, that is, from .47 to .46.

Also for the Chicago, Milwaukee & St. Paul from 1895 to 1902, the train load increased from 152 to 285 tons, nearly double, and the cost dropped from .67 to .56, but since then the train load has decreased slightly and the cost has risen to .59. In this case again the lowest cost is accompanied by the heaviest train. Other roads, however, show an increased cost (generally slight), although the train load has become slightly heavier, this being due, no doubt, to the greater charges for labor and material. If we now return to the table of train weights, we will see what enormous strides some of the lines have made in introducing heavier trains. The Lake Shore & Michigan Southern has increased from 318 to 615 tons in 10 years, or nearly double, and the Chicago, Milwaukee & St. Paul has accomplished nearly as much in proportion, but its average train load now is not as great as the Lake Shore's was 10 years ago. This is accounted for by the fact that the Lake Shore is nearly straight, with maximum grades of 18 ft. per mile, while the Milwaukee has grades possibly three times as steep, and numerous branch lines of light traffic.

We must not confuse these train loads, however, with what is really hauled by the locomotives, as the Lake Shore has engines which can pull 3,000 tons or more back of the tender. As stated above, the figures are the average train loads for main lines and branches, and, moreover, do not include the weights of the cars themselves, which may be from one-half to one and one-half times the load, depending on whether it is heavy (like coal and ore) or bulky (like some classes of merchandise, such as furniture). One of the transcontinental lines recently so grouped its power that it could move trains from 1,350 to 2,600 tons westbound; that is, the train load back of the tender lay between these limits for different portions of the line, the locomotives being located according to the grades encountered, the idea being to maintain a constant train load as far as possible.

Of course, introduction of heavy locomotives into the power equipment of a railroad will have an immediate effect upon the average train load, but even if 100 such machines were introduced into a lot of 1,000 engines, the general average would be but slightly raised.

Statements from different roads show that locomotive growth is not responsible for all the increase in train load, and that we might look elsewhere for the reason. The portion which cannot be attributed to the size of the locomotive must be credited to the system of tonnage rating, and its accompanying results. When an engine was given 30 or 40 cars without regard to their loading, it might be stalled on controlling grades, or be under loaded. When there was a little congestion, and rates were high, these things received little attention, but with increasing competition and the advance in costs, it became necessary to figure closely upon the hauling power of the locomotive and the resistance of the train. By this means cars were given more nearly their true value in making up a train, and straw hats and pig iron were no longer considered equal loads.

By repeated trials and changes of method, the rating of engines is now so perfected on a few roads that the engines are run at the most economical tonnage and speed, all things considered. Where this adjustment has been made, any further saving must come from heavier power, as has been to some extent the case in the past.

IX. RELIABILITY OF SERVICE.

This division of the subject is taken to mean the number of engine failures as related to the trains run both twenty years ago and to-day.

First it will be well to discuss what is meant by an engine failure. Some roads report as an engine failure anything whatever that delays a train over two minutes on the road, which is charge-

able in any way to the locomotive, whether or not such time was subsequently made up. Other roads count only breakdowns. The Chicago & North-Western Railway has made the definitions of an "engine failure" the subject of an official circular, which has been in effect several years.

1. All delays waiting for an engine at an initial terminal, except in cases where an engine must be turned and does not arrive in time to be despatched and cared for before leaving time.

2. All delays on account of engines breaking down, running hot, not steaming well, or having to reduce tonnage on account of defective engine, making a delay at a terminal, a meeting point, a junction, or delaying other traffic.

The first case could not have been any different with engines twenty years ago than to-day. The second, which embraces breakdowns, hot boxes, and failures for steam, are chargeable more to the engine than are delays at initial terminals, but even these are not always the fault of the engine or crew. All know of cases where engineers have reported loose eccentrics time and time again, but because the cams would have to be taken off and reduced, nothing was done but tighten a set-screw, perhaps. Then the eccentric shears off a key and slips around. The engine may limp into the next division point, but there is a breakdown charged against the engine and crew when the roundhouse foreman or some higher authority was more responsible than the crew. In general, the reason engines of to-day would be more or less reliable than those of twenty years ago is on account of the service they have to perform and the care taken of them and the use of material better adapted to the special service in which it is used. The higher speeds of to-day are hard on the engine. The excessive loading which some trainmasters expect a freight engine to handle often accounts for a failure which would not have occurred had the engine been more properly rated.

The use of cast-steel driving tires and centers in place of cast-iron, of steel boiler-plates in place of laminated iron, of high carbon forging for axles, pins, and rods in place of case-hardened iron, have all tended to materially increase the reliability of the engine of to-day as well as to decrease the cost of maintenance. The care used in the selection and inspection of material, and the corps of trained chemists and metallurgists maintained by the large manufacturing plants of to-day have all assisted to this end.

The art of building locomotives may progress unevenly, that is, a fault may creep into all engines built for a certain period of years, which is due to the use of the same design or method of manufacture when it no longer produces a satisfactory product. When the fault is recognized, the method, material or design is changed and a finer article is produced than ever before, only to make some other part seem unsatisfactory in comparison.

To show where the new power is more satisfactory than the old, the following experience may be cited. For a long time the service between certain points was erratic. The trains were hauled by eight-wheeled engines which were too small to make time with the trains put behind them. Being old, they were subject to frequent breakdowns on the road. In their youth these engines had done the work expected of them. The trains were less and less regular, until a sufficient number of powerful ten-wheel engines were purchased and the trains are now run so that the officials are proud of the railroad's record of scarcity of train delays from engine failures.

X. HOURS LOST BY BEING HELD FOR SHOP REPAIRS.

This may be said to have nothing to do with the size of the engine. Of course, in any modern shop the small engines of fifteen years ago which are still running can be repaired with much less labor than the modern power, but the biggest engines are given a complete overhauling to-day in less time than was necessary for any engines twenty years ago.

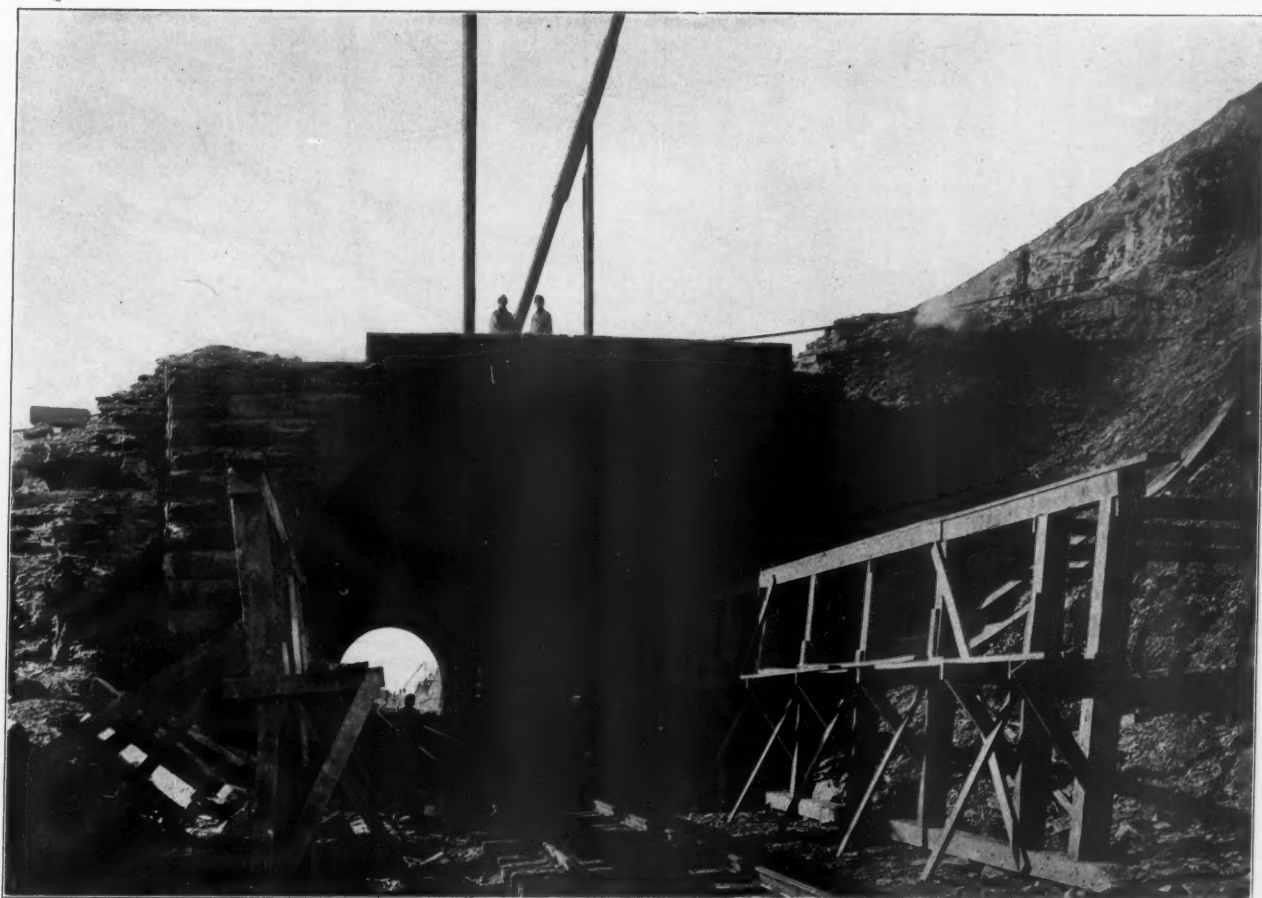
In one of the shops of the northwest, where a proper system of shop management has been in conscientious operation for four or five years, the time of general repairs has been reduced from one month to thirteen days.

The cost of maintenance has been reduced when based on the cost per ton mile as is shown by the following table for one of the southeastern lines:

Cost of Maintenance per Ton-mile. (For one of the southeastern lines.)			
Cost of repairs per 1,000 freight ton-miles.		Cost of repairs per 1,000 freight ton-miles.	
1897.....	25.4	1901.....	18.2
1898.....	23.9	1902.....	21.6
1899.....	21.7	1903.....	21.6
1900.....	20.3		

Removal of Bulger Tunnel.

Bulger tunnel, on the line of the Pittsburg, Cincinnati, Chicago & St. Louis is about 24 miles west of Pittsburg. In 1887 this tunnel, which is 320 ft. long, was widened for double track and lined with brick and stone. When the necessity for a third track in this territory arose it was decided to remove the tunnel entirely and make instead an open cut through the ridge that it pierced. This work is now in progress and the accompanying views, taken



Erecting Centers Before Removing Masonry of Bulger Tunnel—P. C. C. & St. L.



Cutting Out Bulger Tunnel on the P., C., C. & St. L.

February 23, give a good idea of its features. The opening is being made wide enough for four tracks and is about 90 ft. deep. It contained about 235,000 cu. yds. of material, principally rock. The alignment in connection with this work is also being materially improved, 2 deg. curves replacing a number of curves of 4 and 6 deg. We are indebted to Mr. W. C. Cushing, Chief Engineer of Maintenance of Way of the Southwest System of the Pennsylvania Lines West of Pittsburgh, for the photographs.

Railroad Decisions in April.

Public Lands.—The act of Congress authorizing the confirmation of titles to *bona fide* purchasers of land erroneously patented to western railroads will not be a bar to a suit by the government against the railroad company conveying the land to recover the value of these lands. *Southern Pacific R. R. v. United States*, 26 Sup. Ct. Rep. 296.

Drainage through Rights of Way.—The Illinois Farm Drainage act, which charges railroad companies with the expense of removing soil when necessary to widen and deepen channels through rights of way to carry increased volume of water, and also with the cost of new bridges and culverts made necessary by these changes, violates the constitutional inhibition against taking property without due process of law in placing the expense of moving the soil to widen the channel on the railroad company. The provision placing the expense of erection of bridges and culverts to conform to the new conditions is sustained against the objection that it is likewise a violation of the due process provision, and in addition the constitutional provision guaranteeing the equal protection of the laws to all citizens. *Chicago, Burlington & Quincy R. R. v. Grimwood*, 26 Sup. Ct. 341.

Removal of Condemnation Proceedings to Federal Courts.—The mere fact that a non-resident defendant in condemnation proceedings is the owner of part of the lands sought to be taken as a whole for railroad purposes does not create a separable controversy between the particular land owner and the railroad company under the Wisconsin eminent domain statute, so as to entitle him to remove the proceedings to the Federal Court on the ground of diversity of citizenship. *Perkins v. Lake Superior & Southeastern Railway*, 140 Fed. Rep. 906.

Receivership Proceedings.—A federal court in possession of the property of an insolvent railroad through a receiver will not be ousted of exclusive jurisdiction over the property by the fact that a mortgagee residing in the same state with the railroad company, and thus entitled to bring foreclosure in the state courts, has intervened in the proceedings to enforce his particular rights under the mortgage. *Cole v. Philadelphia & Easton Railway*, 140 Fed. Rep. 940.

Liability as between Lessor and Lessee of Railroad.—In the absence of a statute fixing liability, a railroad company leasing its railroad to another company is not liable for injuries resulting from negligence of the lessee company in its exclusive operation of the road. It follows that the joinder of the non-resident lessor and the local lessee as defendants in a suit by an injured employee will not authorize the removal of the action to a federal court, as the action is really against the local company alone. *Curtis v. Cleveland, Cincinnati, Chicago & St. Louis Railway*, 140 Fed. Rep. 777.

Routing by Initial Carrier.—The provision of the Interstate Commerce Act which requires filing of joint traffic rates, when agreed upon with the commission, does not forbid the adoption by carriers as part of an agreement for a through rate from California to the east of a rule allowing the initial carrier the right to route the shipment beyond its own terminal as a condition to guaranteeing the through rate. This particularly where the purpose of the rule is to prevent rebating by connecting lines. In the practical operation of the rule the shipper has generally directed the actual routing, and his request to divert the shipment *en route* has usually been respected. Neither is the rule open to the objection that it works a discrimination or is in effect a pooling device. Also a federal circuit court may enforce an order of the Interstate Commerce Commission to a railroad company to desist from enforcing a rule, though for a different reason than the one relied upon by the Commission. *Southern Pacific Co. v. Interstate Commerce Commission*, 26 Sup. Ct. Rep. 330.

Minnesota Fence Law.—The Minnesota railroad fence law, when applied to a case of parallel railroads, does not allow a recovery against one of the companies for an animal injured or killed on the adjoining right of way, although the animal reached the right of way where it was killed through a defective fence of the former company. The action lies solely against the railroad which ran over the animal. *Bear v. Chicago Great Western Railway*, 141 Fed. Rep. 25.

Eminent Domain of Foreign Companies in Kentucky.—A railroad company incorporated under the laws of a sister state cannot exercise the right of domain under the laws of Kentucky unless it is incorporated under the laws of that state. This right is not con-

ferred by mere compliance with a law of Kentucky authorizing foreign railroad corporations to possess control and maintain railroads in that state on filing their foreign articles of incorporation with the state. *Evansville & Henderson Traction Co. v. Henderson Bridge Co.*, 141 Fed. Rep. 51.

Time of Filing Claims.—A federal court will permit the filing of a personal injury claim against a receiver of a railroad after the time fixed by a notice for the filing of claims, in a case where the claimant is a minor and the negligence is that of his representative. *Park v. New York, Lake Erie & Western R. R.*, 140 Fed. 799.

Colorado Frog Blocking Act.—The law of Colorado which requires railroads to securely block all frogs and switches does not deprive a railroad company of the right to defend an action for an injury caused by a failure to observe this law by showing that the employee continued his employment with the knowledge of this violation of the law and hence assumed risk of injury from the defect. *Denver & Rio Grande R. R. v. Norgate*, 141 Fed. Rep. 247.

Venue of Suits.—A railroad company may waive its right under the statute to be sued in the federal court of the district of its corporate residence by making a general appearance in a suit without objection to the jurisdiction of the court. *Mahr v. Union Pacific R. R.*, 140 Fed. 921.

Pacific Coast Railway Club.

The March meeting of this club, held at the Palace Hotel, San Francisco, on the 17th, was given up to an address on Railroad Young Men's Christian Associations, by Mr. George D. McDill, of the International Committee. Mr. McDill's talk was illustrated with stereopticon views showing the railroad Y. M. C. A. buildings at Springfield, Mass.; Port Richmond (Philadelphia), Pa.; Collinwood, Ohio; Oakdale, Tenn.; St. Paul, Minn.; McKee's Rocks, Pa.; Binghamton, N. Y.; Bellevue, Ohio; Douglas, Ariz.; Helper, Utah, and Childress, Tex. Seven of these buildings cost over \$25,000 each. Most of them are new, and the collection of pictures was unusually interesting. The views are reproduced in the Proceedings of the Club, Volume 7, No. 11. Mr. McDill gave interesting facts concerning the rapid growth of the association on the principal railroads. On the Gould Lines in the Southwest, in the five years following 1899, the number of associations increased from eight to 25; membership from 1,000 to 10,000; percentage of running expenses paid by members from 48 to 75. At Pocatello, Idaho, the total membership of the railroad association is 620, of whom 378 are members of no church, 125 members of the Mormon church, 99 of the Roman Catholic Church, and 18 of all Protestant churches.

The speaker devoted himself more particularly to the Y. M. C. A. work west of the Missouri river, and told of the large sums paid by the roads in that region for Y. M. C. A. buildings. In conclusion, Mr. McDill said that the most westerly buildings of the Railroad Y. M. C. A. were those at Helper, Utah, and Douglas, Ariz. These two associations, with Pocatello, where money is being raised for a building, form the frontier of the railroad work. . . . "I want to see the time when California, and Oregon, and Washington shall have adequate provision for their railroad men in club houses such as you have seen before you to-night, and under the auspices of the Young Men's Christian Association. No other club plan has ever been successful for any length of time. The Association has to-day practically the only experts in welfare work in the country. Over 2,000 men are now employed by the North American Associations, and the majority of these men could command larger salaries in other vocations. But they are giving their lives to help men, and I want to commend to you their work, and ask you who are present to-night to help the Association to secure a foothold on this coast."

Foreign Railroad Notes.

The returning soldiers seem to have taken possession of the Siberian Railroad, and to be working it very badly, even for their own interest, which is to get home as soon as possible. A correspondent of a Russian newspaper who tried to return from Manchuria says that the soldiers would not permit passenger trains to overtake and pass soldiers' trains (long trains of freight cars, which can only move slowly); that they flatly refused to obey either their own officers or the railroad authorities, and often destroyed buildings, etc., on the line. They were determined, they said, no longer to starve and freeze in Manchuria.

The Berlin Elevated Railroad, a massive masonry construction for the most part, was built quite as much for the entrance of trains from other railroads and for the passage of such trains through the city from east to west as for strictly urban travel. Now it is found that these long distance trains limit the city travel unduly: not trains enough can be put on to accommodate the travel. To remedy this there is now talk of designing two-story cars for the city trains, the upper story to be entered from special station platforms. The German Society of Mechanical Engineers offers a prize of 6,000 marks for an effective working out of this plan.

GENERAL NEWS SECTION

NOTES.

The Louisville & Nashville is to haul from Louisville to New Orleans 20,000 carloads of cement for the Panama Canal.

At Washington, April 27, the house committee on interstate and foreign commerce, held hearings on a number of bills which have been introduced to limit the working hours of railroad trainmen.

The Chicago, Milwaukee & St. Paul has put on a new train each way daily between Chicago and Milwaukee and has quickened the time of others so that four trains each day traverse the distance (85 miles) in 1 hour, 45 minutes.

Horace E. Winchell, Chief Geologist of the Amalgamated Copper Company, has resigned, to take charge of a department of geological research which has been started by the Great Northern Railway.

At Clarksburg, W. Va., April 28, the grand jury in the Federal Court returned five indictments against the Baltimore & Ohio for alleged discrimination in the distribution of cars to the Philippi, the Pennsylvania, the Meadowbrook and the Hutchinson Coal companies.

The Supreme Court of Somerset County, Maine, has awarded damages of \$25,208 to a man injured in a collision on the Maine Central two years ago, the largest sum ever awarded for such an accident in the state of Maine. The railroad company will, no doubt, appeal.

The American Rio Grande Land & Irrigation Company, which proposes to irrigate a million acres of land in Hidalgo and Cameron counties, in the southern part of Texas, is said to be backed by interests connected with the Rock Island road, who hope to promote the prosperity of that road.

The Independent Order of Tie-Tampers, long expected, has at last appeared; or at least an agitator representing the "International Brotherhood of Maintenance of Way Employees" is trying to arouse interest in "organization" among track repair men on the Southern Railway in Tennessee.

The New York Central has extended and made more stringent the regulations for the physical examination of applicants for employment, with a view, among other things, to the establishment of a pension system. The payment of pensions to superannuated employees will probably begin the first of July.

The Chicago City Railway has increased the pay of its conductors and motormen to a scale which is said to be higher than that of any other street railway in the United States. Twenty-five cents an hour will be paid after the first year. Other employees of the company have received an increase of 5 per cent.

A press despatch from Chicago says that an attempt is to be made to make some profitable use of the "Stickney tract" freight transfer yards at Chicago, which have been idle for five years. It is said that over \$5,000,000 has been expended on this property already, and that Mr. John F. Wallace has now been engaged to study the problem.

According to an enterprising and truthful reporter in Middletown, N. Y., the Erie Railroad not only encourages its employees to play baseball and to organize teams, but promises to allow them to play on the company's time and to provide transportation for teams from one town to another along the line. The team which makes the best record this season "will receive a gold cup"; but the reader is left in delightful uncertainty as to who is to put up the money for the cup.

A press despatch from Baltimore says that the Baltimore & Ohio Railroad, following the recent inquiries made by the Interstate Commerce Commission, has disposed of its ownership in the Consolidated Coal Company, and that the president and two vice-presidents of the road have resigned as directors in the coal company. This coal company controls eight subordinate coal companies. It is said that the B. & O. owned 53 per cent. of the coal company stock and that the sum now received for this stock is about \$5,000,000.

The North & South Dispatch Company is the name of a fast freight line, which has been formed by the New York Central Lines and the Mobile & Ohio. By the use of three New York Central lines—the Lake Shore & Michigan Southern, the Indiana Harbor and the C., C. & St. L.—a pretty direct line is formed from Chicago, by way of Cairo, to the southern terminus of the Mobile & Ohio; and by the use of the New Orleans & Northeastern a Chicago-New Orleans line is formed. The headquarters of the Dispatch will be at

New Orleans, and the General Manager is J. H. Brown. The line will begin business with 2,000 cars.

The American Shippers' Association, said to be an organization which was formed sometime since for opposing the uniform bill of lading that was agreed upon by the railroads, is to be reorganized, if the president of the association succeeds in his present purpose. He proposes to secure a general reduction in freight rates. In a prospectus which has been issued, it is declared that the changes in classification which have been made during the past few years, with the withdrawal of rebates, has greatly increased the burden of freight charges on shippers. The railroads, it is alleged, have shown a grasping disposition, which has grown stronger month by month.

The newspapers report that the disagreement between the railroads and the International Harvester Company concerning the payment of \$200,000 demurrage on freight cars has been settled, and that the suits begun by the railroad companies against the harvester company have been withdrawn. The reports say that the settlement was a compromise; but, from the details given, the "compromise" was apparently all in favor of the railroads. The railroads agree to treat the Illinois Northern, the harvester company's railroad, as a common carrier, so far as concerns cars delivered to it for industries other than the harvester works; but on cars for the harvester company itself the payment must be \$1 a day, the regular demurrage rate, which is what the railroads have claimed from the first. It is said that there are only two other concerns on the Illinois Northern tracks.

The Debate in the Senate.

There is a tendency in certain quarters to set an extraordinary value on the debate now running in the Senate on the Railroad Rate bill. It has been said that not during the present generation has the Senate shown in its discussion of a public question more of the qualities of statesmanship than its members have exhibited in the last few weeks. It would be a pleasure to agree with so flattering a judgment, but giving the Senate all the credit which is its due we can hardly admit that its reputation has been enhanced by its uncertain, hesitating and altogether feeble-forcible treatment of the rate problem. The debate has been full of legal pyrotechnics, of brilliant academic disputation, of demonstrations and counter-demonstrations of undoubted cleverness. But we doubt whether these legal and constitutional clashes have helped materially to clear the situation, or have resulted in definite parliamentary progress. The discussion has turned on technicalities, and has tended to obscure rather than develop the real points at issue. Extraordinary stress has been laid by the opponents of the Hepburn bill on its unconstitutionality. Yet if it is unconstitutional that vice ought to commend it especially to its enemies, who could well afford to help it joyously through the Senate. The question of granting or not granting a complete court review has also been greatly befogged. There is nothing mysterious about the matter. Congress has only to choose between fortifying the power of the commission by reducing the right of review to its narrowest constitutional limits and weakening the commission's power by granting the broadest review rights possible. . . .—*New York Tribune*.

Strikes on the Great Lakes.

Press despatches of May 1 from Chicago and other points on the Lakes reported almost complete paralysis of lake traffic, in consequence of strikes. The Licensed Pilots' Association is attempting to force recognition of its union, and 45,000 men are said to have left their work. At Cleveland the tug firemen struck, and passenger steamers had difficulty in getting to and from their docks. At Ashtabula the longshoremen struck, and business was so paralyzed that the railroads laid off many of their switching crews.

From the Unrevised Version.

It is more blessed to receive a rebate than to give one, and the other fellow takes the risk.—*Puck*.

All Serene in Jersey.

Pennsylvania Railroad annual passes gladdened the hearts of members of the New Jersey Legislature yesterday. They arrived in the morning mail, and were in the nature of a surprise. The members knew the law entitled them to free transportation during the session of the Legislature, and the passes given at that time expired on Monday last, 10 days after adjournment. That new passes, good until December 31 next, should be sent in their stead was unexpected. The evening mail brought annuals from the Central Railroad of New Jersey, and from the West Shore. In view of the fact that the Legislature had increased the taxes of the railroads four-fold, or more than \$3,000,000 per annum, the members are at a loss to account for this outburst of generosity.—*Philadelphia North American*.

The Enterprise Transportation Co.

The Interstate Commerce Commission has reported on the alleged unlawful discrimination against the Enterprise Transportation Company. Commissioner Prouty, in the opinion, says: "It appears that railroad lines leading west from New York City make joint through rates with the New England Navigation Company, controlling the Fall River line of steamers, which plies between New York and Fall River, Mass., and some other New England cities, and also controlling other important steamer lines operating on Long Island Sound. Such joint rates apply in both directions between western and New England points. The New England Navigation Company is owned and operated by the New York, New Haven & Hartford. The rail lines centering in New York and running westerly thereof refuse, for stated business reasons, to make the same or any joint rating arrangement with the Enterprise Transportation Company, a steamship line plying between Fall River and New York City. The Fall River line may, by reducing rates on local traffic, force out of business the Enterprise Transportation Company, while obtaining a lucrative and supporting business from through traffic, and upon disappearance of such competition, restore the former charges. The existence of the Enterprise Transportation Company as a competitive factor is of distinct value to the public, and that existence may depend upon its right to engage in through business. This investigation was made with the understanding that the Commission is without power to grant any relief, and no opinion as to whether the through routing arrangement should be extended to the Enterprise Company is expressed, but the Commission is of the opinion that if the public is to have the legitimate benefit of water competition, it is evident that authority should be provided to establish through routes between rail and water carriers, or at least to prevent unjust discrimination by rail carriers between connecting water lines."

Improvements at Parkersburg.

The Baltimore & Ohio is to make extensive improvements at Parkersburg, W. Va., to cost about \$150,000. The work includes the enlargement of the freight yard to more than double its present capacity, and the building of a roundhouse, a machine shop and an oil house. Bids will soon be asked for these improvements and the work started as soon as the contract is let. This improvement is mainly required by the abandonment of Belpre, Ohio, as a freight terminal and the making up and handling of all freight trains at Parkersburg. The bridge over the Ohio river has been so strengthened that train engines can be run over it. Heretofore the bridge was so light that eastbound trains had to be set off at Belpre and westbound at Parkersburg and taken over the bridge by small engines.

Telegraph Lines in Europe.

According to the *Moniteur Industriel* the length of the telegraph lines of the world is about twice that of the railroads, so that, as there are about 540,000 miles of railroad, there are about 1,080,000 miles of telegraph lines. The telegraph lines of the principal countries of Europe have been developed as follows:

	Length of line, in miles.	Miles of single wire.
Russia	108,445	335,456
France	92,917	354,170
England	83,125	308,153
Germany	48,966	477,850
Italy	26,978	86,048
Austria	21,475	69,247
Spain	20,687	51,155
Hungary	14,303	74,184
Sweden	5,931	18,052
Portugal	5,293	11,670
Belgium	4,053	21,839
Holland	4,000	16,119

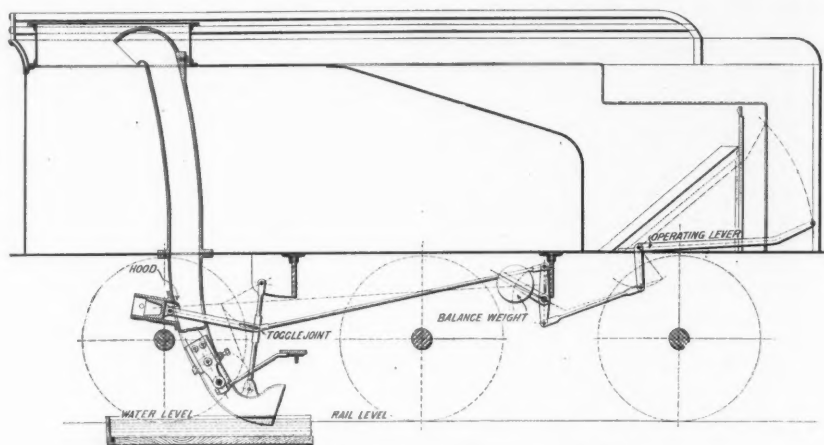
Time Limit—April 3, 1907.

"Thank the Lord!" exclaimed the fourth oldest Senator in point of service on Monday, when arrangements were at last made for a vote on the rate bill. The country, however great its admiration for the ability and industry demonstrated in the long debate, will cordially echo the exclamation. Yet even the agreement to debate the amendments seriatim under a fifteen-minute rule does not indicate undue precipitancy. If the Senators use to the full their privileges under the special rule, we may have to wait several days yet for the final verdict. Each of the ninety senators can speak fifteen minutes on each of the ninety pending amendments. That makes a possible maximum of 121,500 minutes' debate, or 338 legislative

days of six hours each. This is what the Senate means by "strictly limiting debate" and "putting the screws on."—*Evening Post*, New York.

A New Water Scoop.

A new design of water scoop has been invented by H. A. Ivatt, Locomotive Engineer of the Great Northern (England). The novel feature is the cylinder shown in the drawing, into which part of the ascending water is deflected by a hood, and puts enough pressure on the piston to offset the tendency which the water in



Water Scoop on the Great Northern, England.

the trough has to drag down the scoop when traveling at high speed. This arrangement also makes it easy to lift the scoop with the operating lever. The balance weight is sufficient to lift the scoop clear automatically as soon as the trough is passed. This apparatus is now in operation on the Great Northern.

Manufacturing and Business.

L. C. Chase & Co. (Sanford Mills) makers of the Goat brand of mohair plushes, have moved their office from 129 Washington to 89 Franklin street, Boston, Mass.

The New York office of the National Paint Works has been moved from 92 William street to 100 William street.

The East St. Louis Locomotive & Machine Shop Co., East St. Louis, Ill., has just purchased from the Southern Railway 13 locomotives of different classes and weights. It is also building a brick and steel structure to be used as a boiler shop, which will be equipped with new rolls and machinery. A new 150 h.p. boiler and a 125 h.p. Corliss engine are also being installed.

Iron and Steel.

The Trans-Continental Railway Commission of Canada will soon ask for bids for 50,000 tons of rails and 2,500 fastenings.

The Vandalla has given a contract for 6,800 tons of rails for 1906 delivery. The Tidewater Railroad is negotiating for 27,000 tons to be delivered next year.

A joint resolution was introduced in both Houses of Congress on April 23 suspending for one year the duty on structural steel and other building materials, for use in buildings in San Francisco and other California cities destroyed or damaged by the recent earthquakes.

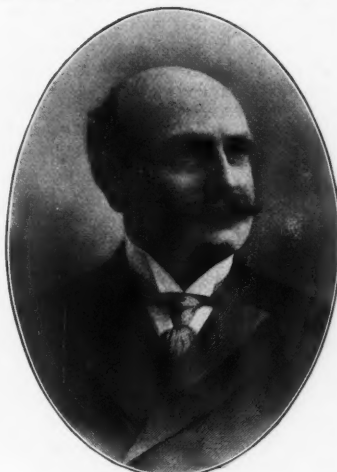
The demand for rails in Canada is so great and unusual that the steel works at Sault Ste. Marie cannot fill its orders. The company has booked 185,000 tons. One order has been given by the Hill roads for 50,000 tons. The Canadian Pacific has also a 50,000 ton order being filled.

The Pacific Electric Railway has given a contract for 2,000 tons of rails additional for 1906 delivery, making its total purchases 14,000 tons. The Spokane & Inland has ordered 7,000 tons; the Delaware & Hudson 16,000 tons; the Oklahoma Railway 1,300 additional, and the Louisville & Indianapolis Traction Co., 4,500 tons.

OBITUARY NOTICES.

Brigadier General E. W. Serrell died in New York on April 25. He was born in London in 1826. He worked in the Engineering Department of the Central Railroad of New Jersey and on the Erie, and then, when only 22 years old, was sent to Panama, where he surveyed the route of the present Panama Railroad. In 1850 he was Chief Engineer of the construction of the Niagara suspension bridge, and later of the Hoosac Tunnel. He commanded a regiment of volunteer engineers during the Civil War.

Henry C. Rouse, Chairman of the Board of the Missouri, Kansas & Texas, died at Cleveland on April 30 after an illness of two weeks.



H. C. Rouse.

he investigated the railroads of India.

Mr. Rouse was born in 1853. In 1885 he joined the syndicate which built the Chicago, Wisconsin & Minneapolis. He was later interested in the development of what is now the Chicago Terminal Transfer, and in 1891 was elected Chairman of the Board of Directors of the M., K. & T. The next year he was elected also President of the Missouri, Kansas & Texas of Texas, which position he held at the time of his death. From 1892 to 1904 he was President of the Missouri, Kansas & Texas, and from 1893 to 1896 acted as receiver of the Northern Pacific. Mr. Rouse has also been President of several other railroads. In 1903 he inspected the Chinese Eastern and the Trans-Siberian; in 1895

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad conventions and engineering societies, see advertising page 24.)

Engineers' Club of Philadelphia.

At the meeting of this club to be held May 5, there will be a paper on Corrugated Concrete Piles by Frank B. Gilbreth, illustrated with lantern slides.

St. Louis Railway Club.

At the annual meeting of this club officers for the ensuing year were elected as follows: John J. Baulch, President; S. D. Webster, First Vice-President; Geo. Hannauer, Second Vice-President; B. W. Frauenthal, Secretary, and Chas. H. Scarritt, Treasurer.

International Railway General Foremen's Association.

The next annual convention of this Association will be held at St. Louis, Mo., beginning May 8. All sessions will be open to those who are interested in the mechanical department of railroad service. The programme includes the following list of topics to be discussed: Reasons Why An Organization of Foremen Should Exist, by D. E. Barton; Modern Machine Shop Practice, by Lee R. Laizure; The Duties of the Foremen, by G. W. Keller; Broken Frames, by C. H. Voges; Pooling Engines, J. C. Wilkinson; Electric Lights, A. S. Abbott; Motive Power by Electricity, L. H. Raymond; Leaky Flues, B. E. Greenwood; Qualities of a First-Class Roundhouse and Division Foreman, G. H. Gates. W. H. Graves is President, and E. C. Cook, Secretary.

American Society and International Association for Testing Materials.

The ninth annual meeting of the American Society for Testing Materials will be held at Atlantic City, N. J., June 21-23. The next Congress of the International Association for Testing Materials will be held at Brussels, Belgium, September 3-8, 1906. Members of the American Society may become members of the International Association by being proposed by two members of the Association. The total membership of the American Society is now 786, of whom 240 are members of the International Association. Among the papers to be presented at the Brussels meeting are the following:

"Methods for the Examination of Welding and Weldability," by Prof. Reinhold Krohn, of Danzig.

"Report on the Progress of Metallography since the Congress at Budapest, 1901," by F. Osmond and G. Cartaud, of Paris.

"Report on the Relation of Chemical Composition to the Weathering Qualities of Building Stones; the Influence of Smoke and Especially Sulphurous Acid, on Building Stones; the Weathering Qualities of Roofing Slates," by Prof. A. Hansch, of Baurat.

"Examination and Evolution of the Resolutions of the Conferences from 1884-1893, Concerning Adhesive Strength of Hydraulic Cements," by R. Feret, of Boulogne.

"Determination of the Liter Weight of Cement; the Strength of Real Hydraulic Cements," by Prof. F. Schule, of Zurich.

"A Uniform Method for the Separation of the Finest Particles in Portland Cement by Liquid and Air Processes," by Prof. M. Gary.

"On the Behavior of Cements in Sea Water," by H. le Chateller, Paris.

"On Accelerated Tests of the Constancy of Volume of Cements," by B. Blount.

"Tests to Determine Durability of Wood," by Dr. C. V. Tuben.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

Atchison, Topeka & Santa Fe.—Victor Morawetz, Chairman of the Executive Committee and General Counsel, has resigned as General Counsel. W. D. Hines, formerly Vice-President and General Counsel of the Louisville & Nashville, succeeds Mr. Morawetz, effective May 15.

Operating Officers.

Chicago, Burlington & Quincy.—A. N. Willsie, who was recently appointed Superintendent of the St. Joseph division at St. Joseph, Mo., began railroad service in 1880, being then 16 years old, as an errand boy in the office of the Master Mechanic of the C., B. & Q. at Galesburg. He was made timekeeper next year, and then worked in various positions in the same office until 1890, when he took a place as locomotive fireman. He was promoted to be engineman in 1892, and in 1898 was made assistant road foreman of engines. He was appointed road foreman of engines of the Galesburg division in 1900, and Master Mechanic at Brookfield, Mo., in December, 1905. On March 1 of the present year he was made Master Mechanic at Aurora, Ill., from which position he was recently promoted.

Chicago, Lake Shore & Eastern.—M. G. Nowak has been appointed Superintendent at Bay View, Wis., succeeding E. H. Hosler, who has resigned to take an office in the Illinois Steel Co., which controls the railroad.

Missouri Pacific.—W. E. Brooks has been appointed Inspector of Passenger Service, with office at St. Louis. He will investigate the conditions affecting passenger train schedules, the condition of passenger equipment, and the efficiency of passenger trainmen and enginemen. He reports to the Assistant General Manager.

Southern.—A. M. Smith, formerly Superintendent of the St. Louis division of the St. Louis-Louisville Lines, has been appointed Assistant Superintendent at Columbia, S. C.

Traffic Officers.

Chicago, Burlington & Quincy.—See Chicago, Cincinnati & Louisville.

Chicago, Cincinnati & Louisville.—William Fitzgerald, Jr., heretofore Assistant General Freight Agent of the Chicago, Burlington & Quincy at St. Joseph, Mo., has been appointed General Freight Agent of the C., C. & L., with office at Cincinnati, Ohio, succeeding T. C. Beyland, Acting General Freight Agent.

Delaware, Lackawanna & Western.—G. A. Cullen, General Western Passenger Agent, has been appointed General Passenger Agent, succeeding T. W. Lee, resigned, effective July 1.

Wabash.—P. W. Coyle, Assistant General Freight Agent at St. Louis, has resigned, to become Traffic Commissioner of the Business Men's League of St. Louis.

Engineering and Rolling Stock Officers.

Delaware, Lackawanna & Western.—D. L. Stewart, Superintendent of Bridges and Buildings at Bath, N. Y., has resigned to go into other business.

Denver, Northwestern & Pacific.—L. D. Blauvelt has been appointed Assistant Chief Engineer of the Colorado-Utah Construction Co., which is building the D., N. & P.

Illinois Central.—J. H. Wynne, Mechanical Engineer, has resigned.

Wheeling & Lake Erie.—A. C. Hezlep, Engineer of Maintenance of Way, has resigned to engage in other business at Cleveland, Ohio.

Purchasing Agents.

Wheeling & Lake Erie.—G. L. Pollock has been appointed Purchasing Agent of this road and of the Wabash-Pittsburg Terminal and the West Side Belt, succeeding J. P. Stark, resigned.

LOCOMOTIVE BUILDING.

The Central of Peru has ordered six 12-wheel cross-compound locomotives from the American Locomotive Co.

The Green Bay, Oshkosh, Madison & Southwestern is reported in the market for locomotives. Address C. H. Hartley, General Manager, Oshkosh, Wis.

The United Railways of Havana have ordered one suburban tank locomotive from the American Locomotive Co.

The Northern Pacific has ordered 30 Prairie type locomotives from the American Locomotive Co., and 15 switching locomotives from the Baldwin Locomotive Works.

The Southern of Peru has ordered 29 twelve-wheel cross-compound locomotives from the American Locomotive Co.

The Gulf & Ship Island has ordered six locomotives. Four of these are to be of the 10-wheel (4-6-0) type, and will be built by the American Locomotive Co., for May delivery. The remaining two, one 70-ton switching locomotive and one Atlantic (4-4-2) type locomotive, have been ordered from the Baldwin Works and are to be delivered in July.

The Nippon Railway, Japan, has ordered 12 Consolidated (2-8-0) locomotives from the American Locomotive Co.

The Lima Locomotive & Machine Co. report the following orders for Shay locomotives for the week ending April 28: Globe Lumber Co., Yellow Pine, La., one 60-ton locomotive; Clark Creek Logging Co., Catlin, Wash., one 37-ton locomotive; Oak Point Piling & Lumber Co., Oak Point, Wash., one 28-ton locomotive, and J. H. Weinkle, Moffitt, Pa., one 10-in. x 16-in. six-wheel switching locomotive.

The Kiushu Railway, Japan, has ordered 12 Mogul locomotives and 24 (2-6-2) side tank locomotives from the American Locomotive Co.

The Maine Central has ordered three six-wheel switching locomotives from the American Locomotive Co., for September delivery. These locomotives will weigh 126,500 lbs.; cylinders, 19 in. x 24 in.; diameter of driving wheel centers, 44 in.; Wootton boiler, with a working steam pressure of 180 lbs.; firebox, 108 in. long by 90¼ in. wide; 209 tubes, 2 in. in diameter by 11 ft. 7 in. long; total heating surface, 1,388 sq. ft.; grate area, 67.7 sq. ft.; capacity of tender, 4,000 gallons, and seven tons of coal. The special equipment will include: Midvale tires, Railway Steel-Spring Co.'s springs, Franklin boiler covering, Hancock injectors, Tower couplers, Westinghouse brakes, National Hollow brake-beams, Ashton safety valves, Star Brass Co.'s steam gages, and Leach sanding devices.

The Texas & Pacific is building two simple Atlantic (4-4-2) locomotives at its own shops. These locomotives will weigh 194,000 lbs., with 110,000 lbs. on the drivers; cylinders, 22 in. x 28 in.; diameter of drivers (outside), 79 in.; radial stay wagon top boiler, with a working steam pressure of 210 lbs.; heating surface, 2,935 sq. ft.; 326 National tubes, 2 in. in diameter and 16 ft. long; carbon steel firebox, 99 in. x 67¼ in.; grate area, 45.3 sq. ft.; tank capacity, 6,000 gallons, and coal capacity, 10 tons. The special equipment includes: Westinghouse air-brakes, Carnegie steel axles, Gollmar bell ringer, Sterlingworth brake-beams, Texas & Pacific brake-shoes and journal bearings, Gould and National couplers, Pyle-National electric headlights, Detroit injector, U. S. metallic piston and valve rod packings, Coale safety valve, Smith sanding devices, Nathan sight-feed lubricators, U. S. Spring Co.'s springs, Ashcroft steam gages, Gold steam heat equipment, Latrobe driving, truck and tender wheel tires, and Scullin-Gallagher steel wheel centers.

The Mexican Central, as reported in a previous issue, has ordered 20 simple Consolidation and five six-wheel switching locomotives from the American Locomotive Co. The Consolidation locomotives will weigh 198,700 lbs., with 179,000 lbs. on drivers; cylinders, 21 in. x 26 in.; diameter of driving wheels, 55 in.; extended wagon top boiler, with a working steam pressure of 200 lbs.; tank capacity, 6,000 gallons, and fuel oil capacity, 3,000 gallons. The switching locomotives will weigh 126,000 lbs.; cylinders, 19 in. x 24 in.; diameter of driving wheels, 50 in.; Belpaire boiler, with a working steam pressure of 180 lbs.; heating surface, 1,793 sq. ft.; 272 charcoal iron tubes, 2 in. in diameter by 11 ft. 7½ in. long; firebox, 90 in. long by 38¾ in. wide; grate area, 24 sq. ft.; tank capacity, 3,900 gallons; fuel oil capacity, 1,200 gallons. The special equipment for both locomotives includes: Westinghouse air-brakes, National Hollow brake-beams, Tower couplers, Friedman injectors, Mexican Central piston and valve rod packing, Ashton safety valve, Leach sanding devices, Detroit sight-feed lubricators, Pittsburg Spring & Steel Co.'s springs, Crosby steam gages, and Franklin Railway Supply Co.'s automatic driving box lubricators for the Consolidation locomotives.

The Long Island is having built at the Altoona shops of the Pennsylvania R. R. 21 simple (4-4-0) locomotives and has ordered four six-wheel simple switching (0-6-0) locomotives from the Baldwin Locomotive Works. The 4-4-0 locomotives will weigh 138,000 lbs., with 97,100 lbs. on the drivers; cylinders, 18½ in. x 26 in.; diameter of drivers, 68 in.; Belpaire boiler, with a working steam pressure of 185 lbs.; heating surface, 1,912.8 sq. ft.; 310 tubes, 1¾ in. in diameter and 136¾ in. long between flue sheets; firebox, 119½ in. long and 40 in. wide; grate area, 33 sq. ft., and tank capacity, 5,500 gallons. The switching locomotives will weigh 123,100 lbs.; cylinders, 19 in. x 26 in.; diameter of drivers, 51 in.; straight boiler, with a working steam pressure of 180 lbs.; heating surface, 1,684 sq. ft.; 270 tubes, 2 in. in diameter and 130¾ in. long between flue sheets; firebox, 103½ in. long and 33¼ in. wide; grate area, 23.81 sq. ft., and tank capacity, 4,000 gallons. The special equipment for both includes: Westinghouse air-brakes, Gollmar bell ringer, magnesia sectional boiler lagging, Diamond special brake-

beams for 4-4-0 locomotives and Sterlingworth brake-beams for switching locomotives; Janney couplers, Dressel headlights and Sellers and Nathan simplex injector for 4-4-0 locomotives; Ajax Metal Co.'s journal bearings for switching locomotives, U. S. piston and valve rod packings, Ashton safety valve, Nathan sight-feed lubricators, Utica steam gages and Mason regulator steam heat equipment for 4-4-0 locomotives; Consolidated safety valve, Leach sanding devices, and Pittsburg Spring & Steel Co.'s springs for switching locomotives, and Latrobe driving wheel tires.

CAR BUILDING.

The Tionesta Valley has ordered 12 tank cars from Robt. M. Burns & Co.

The Oregon Short Line has ordered 15 standard coaches from the Barney & Smith Car Co.

The Pennsylvania, it is reported, will shortly order upwards of 20,000 steel cars for 1907 delivery.

The Denver, Northwestern & Pacific, it is reported, has ordered 75 box, 75 stock and 50 flat cars from the Pullman Co.

The Chicago, Burlington & Quincy has ordered six tank cars of 12,000 gallons capacity from the American Car & Foundry Co.

The Western Maryland, as reported in our issue of April 27, has ordered 500 steel hopper cars from the American Car & Foundry Co.

The Rutland, as reported in our issue of April 20, has ordered 100 80,000 lbs. capacity side dump ballast cars from Haskell & Barker.

The Baltimore & Ohio, it is reported, will shortly give orders for upwards of \$7,000,000 worth of rolling stock, including 6,500 freight cars and a large number of passenger cars.

The Newburgh & South Shore has ordered 100 steel gondola cars of 100,000 lbs. capacity from the Middletown Car Works, for June, July, August and September delivery. These cars will weigh 33,000 lbs. and measure 36 ft. long, 9 ft. 11½ in. wide and 6 ft. high, over all.

The Illinois Central Traction Co. has ordered five fruit cars of 40,000 lbs. capacity from the St. Louis Car Co. These cars will weigh 30,000 lbs. and measure 39 ft. 9 in. long, 8 ft. 6 in. wide and 9 ft. 8 in. high, over all. The special equipment includes St. Louis Car Co.'s standard draft rigging.

The Long Island has ordered 100 swing side gondola cars of 100,000 lbs. capacity and 100 box cars of 100,000 lbs. capacity from the American Car & Foundry Co. The gondola cars will be 37 ft. 5 in. long, 9 ft. 4¼ in. wide and 3 ft. 10½ in. high, inside measurements. The special equipment includes: Sterlingworth brake-beams, Westinghouse brakes and draft rigging, Ajax Metal Co.'s brasses, Tower steel couplers, Soule dust guards, Symington journal boxes, and Pittsburg Spring & Steel Co.'s springs. The box cars will be 36 ft. long, 8 ft. 6 in. wide and 8 ft. high, inside measurements. The special equipment includes: Davis solid brake-beams and Westinghouse automatic brakes.

The New York Central has ordered for the Lake Erie & Western 17 coaches and eight smoking cars from the Pullman Co. The coaches will weigh 110,000 lbs. and measure 70 ft. long, over sills, and 9 ft. 8 in. wide, over all. The smoking cars will weigh 100,000 lbs., and measure 61 ft. long, over sills, and 9 ft. 8 in. wide, over all. The special equipment for both includes: Pullman axles and vestibules, Diamond special brake-beams, Lappin brake-shoes, Westinghouse brakes, Lake Erie & Western brasses, Tower couplers, Forsyth curtain fixtures, Pantasote curtain material, Lake Erie & Western door fastenings, paint and trucks, Harrison dust guards, Gold heating system, Symington journal boxes, Pintsch light, Gould platforms, Railway Steel-Spring Co.'s springs and Paige wheels.

The Southern, as reported in our issue of April 27, has ordered four mail, baggage and express cars; six passenger and baggage cars, and 25 baggage and express cars, and 10 postal cars from the American Car & Foundry Co., for January, 1907, delivery. The mail, baggage and express cars will measure 69 ft. 1¾ in. long by 9 ft. wide; the passenger and baggage cars will be 64 ft. 3½ in. long by 9 ft. wide; the baggage, express and postal cars will be 69 ft. 1¾ in. by 9 ft. wide, all inside measurements. The special equipment for all includes cast-steel double body bolsters, Westinghouse high-speed automatic air-brake, Janney and Buhoup three-stem couplers, Harrison dust guards, Gold heating system, Southern Railway standard type journal boxes, Pintsch lighting system, American Car & Foundry Co.'s steel platform for mail, baggage and express cars, and Standard steel platforms for the remaining cars, Railway Steel-Spring Co.'s springs, Southern Railway standard six-wheel trucks for mail, baggage and express, passenger, baggage and postal cars, and four-wheel trucks for the baggage and express cars; Buhoup short vestibules and McKee-Fuller car wheels.

The Brooklyn Heights Railroad Co. has ordered 10 box cars and 20 gondola cars of 60,000 lbs. capacity from the McGuire-Cummings Manufacturing Co. These cars will measure 40 ft. long by 8 ft. wide. The bodies and underframes are of wood. The special equipment includes, 10 in. built-in transom bolsters; 10 in. automatic air-brake equipments and hand brakes; Standard Coupler Co.'s couplers; Pennsylvania R. R. metallic paint; Diamond frame trucks, and Schoen 33 in. rolled steel wheels. The company is also sending out blue prints and specifications for 100 surface cars. The specifications call for 100 convertible motor surface cars, with a seating capacity for 48 persons; weight, 48,000 lbs.; length, 30 ft. 7 1/4 in.; width, 7 ft. 6 1/4 in., and height, 7 ft. 8 3/4 in., all inside measurements. The bodies are to be of wood, and the underframes are of wood, with a steel side plate. The special equipment will include 8 in. reinforced built-up transom bolsters, Buffalo Brake-Beam Co.'s brake-beams, steel backed flanged Lappin type brake-shoes, Westinghouse air-brakes and hand air-brakes fitted with anti-rattling brake hangers, standard M. C. B. brasses, Curtain Supply Co.'s curtain fixtures, Pantasote curtain material, Wallace Supply Co.'s operating devices for doors, Symington dust guards, Gold double coil electric heaters, Symington journal boxes, built-in vestibules, and 33 in. solid Schoen steel wheels.

BRIDGE BUILDING.

AKRON, OHIO.—At a meeting of the Canal and County Commissioners and the City Engineer it was decided to raise all the bridges over the Ohio and Erie canal at least one foot. The same agreement will be asked of Commissioners in every county through which the canal passes.

ALABAMA.—A bill was introduced in the House of Representatives April 25 and referred to the Committee on Interstate and Foreign Commerce authorizing the Mobile Railway & Dock Co. to build bridges across Dog river and Fowl river, in Mobile County, Alabama.

ASHTABULA, OHIO.—Bids are wanted May 17 by P. C. Remick, Auditor, for building a steel bridge over Mill creek in Dorsett township, Ashtabula County.

ATLANTA, GA.—The Southern Railway has let the contract to W. W. Griffin for building a bridge in Atlanta at Nelson street.

CHENEYVILLE, LA.—The Rapides Police Jury will receive bids May 22 to build a steel bridge over Bayou Boeuf here.

COLUMBUS, OHIO.—A contract has been given to Cook, Grant & Fritz Bros., at \$42,273 for building the substructure for the Reed avenue viaduct. The Commissioners have refused all the bids submitted for the roadways, for encasing the columns, and for the approaches.

GALVESTON, TEX.—A charter has been filed at Austin, Tex., of the Galveston Toll Bridge & Causeway Co., with a capital of \$100,000. The company has been formed to build a causeway to connect Galveston Island with the mainland. The plans call for a structure to carry six tracks, in addition to a roadway and sidewalks, at a cost of about \$1,000,000. R. Clark and J. Young, of Galveston; O. T. Holt and F. L. Dana, of Houston, are interested.

GRAND FORKS, B. C.—A bridge is to be built, at a cost of \$30,000, to a connection with the Kettle Valley Railway.

GUELPH, ONT.—A bridge over Speed River will be replaced by a steel structure.

KANSAS CITY, MO.—On April 23 a bill was introduced in the House of Representatives authorizing the Kansas City, St. Joseph & Excelsior Springs Ry. Co. to build a bridge across the Missouri river.

LAWTON, OKLA. T.—The Board of County Commissioners has directed the County Clerk to ask bids May 14 for building four steel bridges in Comanche County.

LOUISVILLE, KY.—An ordinance has been drafted calling for an appropriation of \$50,000 for building the Oak street viaducts. One of the viaducts, at Ninth street, will receive \$25,000 of the appropriation and will cost, when completed, about \$59,000. The viaduct at Fourteenth street will receive the other half of this appropriation, and will cost, when completed, \$61,000. At the latter point the Illinois Central tracks are to be raised.

NEW WESTMINSTER, B. C.—A steel bridge will replace the present Carnarvon street structure at this place. Mayor Kreamy may be addressed.

NEW YORK, N. Y.—The Bridge Commissioner, who advertised for bids for the Manhattan bridge to be built over the East river, a work which will cost about \$8,000,000, and who was to receive the bids on April 30, was served with an injunction on the morning of that date, obtained by a taxpayer, restraining the Commissioner from

receiving, opening or accepting any bids. The injunction, which was dated April 26, it appears, was not served until it was almost too late to have the terms of the injunction modified. But Bridge Commissioner Stevenson met the situation by communicating with the judge who issued the injunction and prevailed upon him to modify its terms so that all bids could be received, sealed and filed until the injunction was dissolved. The work on this structure has already been delayed a year by litigation, and Commissioner Stevenson was anxious to be in a position to receive the bids advertised for, and not be compelled to readvertise for the same.

NORFOLK, VA.—The Willoughby Bay Railroad Co. is seeking permission to build two bridges with draws over Bush and Masons creeks between Sewell's Point and Ocean View, in accordance with the plans submitted to Captain E. E. Winslow, U. S. Engineer.

OCEAN CITY, N. J.—Surveys are being made to locate the site for a bridge between this place and Somers Point over the bay, to carry electric cars.

PHILADELPHIA, PA.—Bids are wanted May 15 by Thomas L. Hicks, Director, for building the Walnut Lane bridge.

PORTAGE LA PRAIRIE, MAN.—The Canadian Northern, it is said, will build a steel swing bridge over White Mud river on its Oakland extension.

PORTLAND, ORE.—Plans, it is reported, have been completed by City Engineer D. W. Taylor for building a steel bridge on concrete abutments over Sullivan Gulf, to cost about \$65,000.

RICHMOND, VA.—The Citizens' Rapid Transit Co. is planning to build a viaduct along Marshall street to Churchill.

ST. FRANCOIS-XAVIER.—Bids are being received by P. Lavallie for building three steel bridges.

SALINA, CAL.—According to reports from this place the Salinas river has sunk 10 or 12 feet for miles along its course and nearly all the bridges over the river will have to be rebuilt. The disturbance accompanied the recent severe earthquake.

SANDWICH, ONT.—Bids are wanted by John F. Miller, County Clerk of Essex, for building a steel bridge 120 ft. long, with 16 ft. roadway.

SOURIS, MAN.—Bids are wanted May 15 by J. W. Breakey for building a concrete bridge over the Souris river.

TENNESSEE.—Bills have been introduced in both Houses of Congress authorizing the South & Western Ry. Co. to build bridges across the Clinch river and Holston river, in the States of Virginia and Tennessee.

TOLEDO, OHIO.—F. G. Consul, City Engineer, writes us that the date for asking bids for building a reinforced concrete steel bridge 1,200 ft. long over Maumee river, has not yet been decided upon. Bids when asked for will be received by the Secretary of the Board of Public Service.

WILKESBARRE, PA.—Bids are wanted May 25 by F. H. Gates, City Clerk, for building a steel bridge.

WILMINGTON, DEL.—The Water Commission and the Park Commission are planning to jointly build a bridge over the Brandywine near Van Buren street.

XENIA, OHIO.—Bids are wanted May 17 by the Joint Board of County Commissioners of Clark and Green Counties, Ohio, for building an inter-county bridge 189 ft. long, to carry a single track, over Mad river.

YOUNGSTOWN, OHIO.—According to local reports, the Erie has reached an agreement with the city authorities providing for the building of a viaduct to take the place of Hazel street, and to put up a new passenger station. The railroad company will pay \$100,000 towards the bridge, besides spending \$250,000 for the passenger station.

Other Structures.

ATLANTA, GA.—Plans have been completed for building a new freight house for the Louisville & Nashville at the corner of Waverly place and Central avenue, this city, to cost between \$250,000 to \$300,000.

BIRMINGHAM, ALA.—The Southern Railway, it is said, is seeking a site in some southern city for locomotive shops to cost about \$3,000,000.

ELKINS, W. VA.—The Western Maryland will, it is said, build a passenger station here, to cost \$50,000.

FITZGERALD, GA.—The Atlantic & Birmingham has contracted for shops to be built at this place. A tract of 200 acres of land has been bought. The shops will cost about \$600,000.

JACKSONVILLE, FLA.—The St. John's River Terminal Co., during the coming summer, is to spend about \$150,000 in improvements. Of this \$15,000 will be used for new freight yards, a new freight

station, also a pier 400 ft. long and 175 ft. wide, together with a new coaling station, are included in the improvements.

KNOXVILLE, TENN.—The Southern has given a contract to the Oliver-Solitt Co., of Chicago, for putting up a new machine shop at its Lonsdale plant near this city. The American Bridge Co. has the contract for the structural steel to be used. The cost of the improvement will be about \$500,000. The work is to be finished by September of this year.

LITTLE ROCK, ARK.—The St. Louis, Iron Mountain & Southern will build the new union passenger station at this place.

LYNN, MASS.—Plans have been submitted by the Boston, Revere Beach & Lynn Railroad for a new passenger station to be built at Market and Sea streets. The proposed building, which will be a combined station and hotel, will have a frontage of 70 ft. on Market street and 200 ft. on Sea street. In addition a train shed is to be built.

NEW ORLEANS, LA.—The Texas & Pacific is negotiating with the Belt Railroad Commission for a site at Canal street, on which to build a \$100,000 passenger station.

NEW YORK, N. Y.—The Interborough Rapid Transit Co. is to build a new station on the elevated line at Eighth avenue and 120th street, for the use of northbound passengers. There is a station at this point for the southbound traffic.

NIAGARA FALLS, N. Y.—The New York Central has plans made for building a new freight house here, to cost approximately \$80,000.

NORFOLK, VA.—The Atlantic Coast Terminal Co. is planning to build a large railroad terminal here at a cost of about \$5,000,000.

OSWEGO, N. Y.—Plans are under consideration by the railroads interested and the city authorities for putting up a passenger station here to cost about \$30,000.

SANDUSKY, OHIO.—The Baltimore & Ohio Railroad will build here a modern passenger station 76 ft. x 36 ft., to cost about \$15,000. Work will be started as soon as the contract can be let.

SHEBOYGAN, WIS.—The Chicago & North-Western will put up a new passenger station here, at a cost of \$75,000.

WARREN, OHIO.—The Baltimore & Ohio and the Erie, it is said, will jointly build a union passenger station here.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

ADIRONDACK & ST. LAWRENCE.—Under this name a new company has been incorporated in New York, with a capital of \$100,000, to build a railroad from De Kalb Junction southeast to Herman in St. Lawrence County, approximately five miles. The directors include: F. B. Van Vorst, A. Kimber and S. H. March.

ARGENTINE CENTRAL.—This company is building a railroad to carry ore from the Waldorf and other mines at Silverplume, Colo., to Mt. McClellan, 71 miles. The line will cross two mountain ranges. From Silverplume it is said the road will cross Leavenworth mountain along the southeast side until it reaches the Waldorf mining region at the foot of Argentine Pass, thence up Mt. McClellan to Gray's region, at an altitude of 14,000 ft. Nine miles of the road is completed. E. J. Wilcox, Colorado Building, Denver, is President, and A. H. Osborne, of Georgetown, is Chief Engineer.

ARKANSAS, ANTHRACITE & WESTERN.—Incorporation has been granted this company in Arkansas, with a capital of \$2,500,000, to build a railroad from Fort Smith east to Prairie View, in Logan County, 65 miles. The proposed road will parallel the Arkansas river in Sebastian, Franklin and Logan Counties. The directors are: R. M. Remmel, C. McKee, G. Heim and others. The Arkansas Anthracite Coal Co. is interested in this project.

CAIRO & THEBES.—An officer writes that this road will be built and that contracts for the work will probably be let within two months. Preliminary surveys have been completed over the entire route from Cairo, Ill., northwest to Thebes, about 25 miles. E. A. Smith is President and J. L. Armstrong Chief Engineer, Cairo, Ill.

CANADIAN NORTHERN.—This company has started surveys from Edmonton, Alb., to the Rocky Mountains for its proposed line to the Pacific coast.

CENTRAL OF NEW JERSEY.—Plans have been made by this company for new yards to be built in East Allentown, Pa. There are to be a series of three yards containing 20 miles of track, each connected with the other, extending from the East End to Bethlehem Junction.

CHEROKEE, UNION & SPARTANBURG.—At a recent meeting of the incorporators of this company at Gaffney, A. N. Wood, of Gaffney, was elected President and Treasurer, and W. C. Hambrick, Vice-President. Arrangements were completed at this meeting to at

once secure the necessary right of way for building the proposed road in South Carolina.

CHERRYVALE, OKLAHOMA & TEXAS.—A contract has recently been let by this company to the Stubbs Construction Co., of Kansas City, for building 215 miles of its proposed road. The contract calls for building from Caney, Kan., southwest to Kingfisher, Okla., via Pawhuska, Blackburn, Perry and Guthrie. The projected line of the road is from Caney, Kan., to El Paso, Tex., 900 miles. S. M. Porter, Caney, Kan., is President.

CHESAPEAKE & OHIO.—The following table shows the double-track work completed since July 1, 1905, and under way for this company:

Placed in operation since July 1st, 1905:	Miles.
Winifrede to Charleston	13.0
Russell to Riverton	7.8
Total	20.8
Under construction:	
Allegheny to Tuckahoe	1.5
Charleston to St. Albans	11.9
Dayton to Silver Grove	5.7
Walker to Norge	11.2
Sewell Bridge	0.8
Lynchburg to Tyree	3.2
Total	34.3
Contracts just let:	
Grove to Morrison	15.8
Norge to Williamsburg	7.6
Greenway to Riverville	9.0
Jerry's Run to Lewis Tunnel	1.1
Hawks Nest to Cotton Hill	1.2
Gauley to Mt. Carbon	8.4
Maysville to Lawrence Creek	5.4
St. Albans to Barboursville	29.2
Total	77.7
Bids wanted for:	
Concord to Crooked Creek	10.3

CHICAGO, ROCK ISLAND & PACIFIC.—The Roswell Construction Company has been organized to build a railroad from Roswell, N. Mex., to Tularosa, and it is said that the project is being built in the interests of the Rock Island. The proposed road will connect with the Rock Island at Tularosa. U. S. Bateman, J. A. Cottingham, G. T. Veal and H. W. Stevens, all of Roswell, are interested.

CUMBERLAND & NORTHERN.—See Louisville & Nashville.

FORT SMITH, INDIAN TERRITORY & TEXAS.—The charter which was granted this company about two years ago in Arkansas has been sold to the Western Land & Construction Co., of Memphis. The new owners will at once begin the construction of a railroad from Panama southwest to Wilburton, Ind. T., about 50 miles, to connect with the M., K. & T. The route from Fort Smith to Panama, about 20 miles, has not yet been decided upon.

GEORGIA NORTHERN.—Surveys are being made by this company for an extension south from Boston, Ga., the present terminus of its new division to Monticello, Fla.

HILLCREST RAILROAD & COAL CO.—Incorporation has been asked for by a company under this name to build a railroad from Morrissey, B. C., to Hillcrest Junction, and thence to Cardston and Pincher creek, Alb., with branches to the adjoining coal and oil fields near Little Kootenay Lake. Work is to be started as soon as incorporation has been secured.

HOT SPRINGS, OUACHITA & MENA.—See Kansas City Southern.

ILLINOIS CENTRAL.—This company has begun the operation of trains into Indianapolis over the Indiana Southern, which runs from Switz City northeast to Indianapolis. The road will be operated as a branch of the Illinois Central. The Indiana Southern has been building for the past two years, and is about 50 miles long.

INDIANA SOUTHERN.—See Illinois Central.

KANSAS CITY & BELTON.—Incorporation has been granted this company in Missouri to build a railroad from Kansas City south to Belton in Cass County, about 20 miles. The incorporators are: W. J. Bales, D. W. Scott, T. A. Gill, W. Withers and E. S. Yoeman, all of Kansas City and Belton.

KANSAS CITY SOUTHERN.—A contract has been given to Myrick & Andrews for building 270 miles of track on the Central of Louisiana, which was chartered in Louisiana in the interests of this company. The projected road will run from Leesville, La., southeast through New Iberia and thence east to New Orleans. From a point near Rayne, La., the line practically parallels the Southern Pacific to New Orleans. Work has been begun by the contractors at New Iberia and at Baldwin, La., and the work will be rushed to completion.

Under the name of the Hot Springs, Ouachita & Mena, this company has obtained a charter in Arkansas to build a railroad from Mena, Ark., on the Kansas City Southern, east through Montgomery County to Hot Springs, 70 miles air line.

LEHIGH & LAKE ERIE.—See Lehigh Valley.

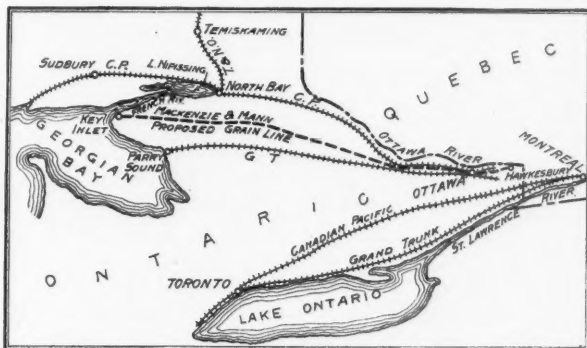
LEHIGH VALLEY.—An officer of the Lehigh & Lake Erie writes that all contracts have been let for building this proposed road. F. D. Hyde, of New York City, has contracts for the grading, masonry

and bridge superstructure. The line will extend south from the Lehigh Valley main line near East Buffalo through Sloan, Cheektowga, and West Seneca, and north through the city of Buffalo on the lake side to the Lehigh Valley at Tift Farm Terminal, 12 miles. About three miles of track has been laid. Part of the road will be elevated, requiring a large amount of filling. The entire road will be double-tracked. Maximum grades will be 0.4 per cent., and maximum curvature three degrees. The work includes the building of 19 steel bridges and two concrete arches. (April 20, p. 123.)

LOUISIANA & ARKANSAS.—This company has track laid for 25 miles on its extension from Packton, La., south to Alexandria, 36 miles. The company expects to make a connection with the Texas & Pacific at Alexandria this month. (See Construction Record.)

LOUISVILLE & NASHVILLE.—This company is reported to be planning to build, under the name of the Cumberland & Northern, a line from Scottsville, Ky., the present northern terminus of the Chesapeake & Nashville, northeast through Columbia and Greensburg to Lebanon, Ky., where connection is to be made with the Louisville & Nashville.

MACKENZIE-MANN SYSTEM.—The Mackenzie & Mann interests are credited with having another line in view. Announcement has been made semi-officially that they intend to begin at an early date building a railroad to haul grain from the mouth of the French river, on Georgian Bay, to Ottawa, and thence to Hawkesburg, where connection will be made with the Great Northern, which runs from that point into Montreal. The distance from French River to Hawkesburg is 370 miles, and from Hawkesburg to Montreal about



Proposed Mackenzie & Mann Grain Line.

60 miles. This is the route of the proposed Georgian Bay canal which the promoters have promised to have completed in 1914.

According to reports from Ottawa, Mackenzie and Mann, under a charter granted to them some time ago, will build a railroad from the south side of Quebec bridge to Moncton, N. B. Such a line would run practically over the same route surveyed by the Grand Trunk Pacific. The Dominion Government, it is said, will grant a subsidy to this Atlantic extension.

MAINE RAILROADS.—Incorporation has been asked for by a company to build a street railroad from a point in South Portland to the Government Reservation at Cape Elizabeth; also at a branch line in South Portland. The capital of the company is to be \$32,000, and the promoters are E. C. Reynolds, J. True, N. True and Charles Dalton, all of South Portland, Me.

MARIETTA & LAKE.—We are told that this company, which was recently organized in Ohio, is making surveys to build a railroad from Jewett, Ohio, south to Marietta through the coal section, about 80 miles. The plans include the building of an extension from McCleary's southwest to Chillicothe an additional 100 miles. W. H. Young, Chicago, is President, and R. S. Blinn, Chief Engineer, Freeport, Ohio.

MIDLAND CENTRAL.—This company has completed surveys and profiles for its proposed road, and bids for the work are to be shortly asked for at the office of the company, Newport, Neb. The proposed line will run through a section 20 to 40 miles distant from any existing road and will be 150 miles long. Lyman Waterman, Newport, Neb., is General Manager.

MILWAUKEE SOUTHERN.—President H. C. Wood confirms the report that this company is making surveys for building a line from Tippecanoe, Wis., southeast to Cudahy and thence north to Bay View and to the works of the Illinois Steel Co. The company plans to touch the various manufacturing sections in Milwaukee and in the immediate vicinity of that city. Construction work is to be started next month.

MUHLBERG & EASTERN.—Incorporation has been granted this

company in Kentucky, with a capital of \$25,000, to build a railroad from Central City, Ky., east to Rochester, 20 miles, through a new coal section. The incorporators are: G. T. Westerfield and T. O. Jones, of Central City; W. F. Ennis, N. Murray and J. R. Drake, of Bowling Green.

NEVADA ROADS.—Residents of Salt Lake, Utah, are planning to build an air line railroad from that city to Ely, Nev., about 200 miles, at a cost of \$2,000,000. There is no road at present entering Ely, but the Nevada Northern is now being built from Toano 240 miles to the north. A direct line from Salt Lake to Ely would shorten the distance to that place over 100 miles.

NEW YORK CENTRAL.—This company is to build a new freight yard between Syracuse and Warner, N. Y., at a cost of \$1,000,000, to relieve the yard at Dewitt. The company has bought some land at Warner, and has options on much more.

OREGON RAILROAD & NAVIGATION.—The Executive Board of this company has authorized an expenditure of \$600,000 for the elimination of curves and rebuilding the line of the Oregon Short Line from Troutdale, Ore., east to Bonneville, 17 miles. The line, which at present runs along the base of the bluffs which skirt the Columbia river, was one of the most difficult and expensive to build. The company is planning to reduce the present maximum curvature of 10 deg. so that the new line will only have curves of 4 deg., and will also do away with about 30 ft. of up and down grades in the 17 miles. The work includes a number of extensive fills, with occasional cuts and the blasting of rock bluffs. Several trestles will be filled in.

An officer writes that this company has given a contract to Erickson & Peterson, of Elgin, Ore., for extending its road from Elgin, Ore., east to Wallowo, Lestine, Enterprise and Joseph. The work includes about 20 miles of road through canyons. There will be four 60 ft. deck girder bridges, three 60 ft. wooden spans, and two 150 ft. steel span bridges.

PACIFIC & EASTERN.—Application has been made to Parliament by Sir Henry Pellatt and others of Toronto, for the incorporation of a company under this name, to build a railroad from Victoria to the easterly end of Vancouver, thence to the main land, and continuing northeast to Edmonton; thence east to Prince Albert and northeast to Hudson Bay.

PENNSYLVANIA.—Contracts for new construction work at a cost of \$2,100,000 have been let by this company. These contracts include the rebuilding and double-tracking of the West Penn between Funnellton and Blairsville, nine miles. When this work is completed the West Penn will be double-tracked throughout except over the bridge at the Kiskiminetas river. The contract includes the building of six stone bridges containing 94,000 sq. ft. of masonry and the boring of a tunnel 600 ft. long. The contractors are: Charles A. Sims, H. S. Kerbaugh and McMenamin & Sims.

PITTSBURG, HARMONY, BUTLER & NEW CASTLE (ELECTRIC).—Application has been made by S. C. Vickers, E. L. Balsinger, T. G. Hamilton, C. C. Gerber and H. Ethridge for the incorporation of a company under this name to build an electric railroad from Allegheny through New Castle to Butler.

SALEM & WESTERN.—This is the name of a new company which has been organized in the interest of the St. Louis & San Francisco, with \$1,000,000 capital, to build a line into the coal fields of Southern Illinois.

SALEM, SPRINGFIELD & PEORIA.—Incorporation has been granted this company in Illinois, with a capital of \$100,000. The company plans to build a line from a point on the Chicago & Eastern Illinois north through the counties of Marion, Fayette, Montgomery, Christian, Sangamon, Menard, Logan, Mason and Tazewell to Peoria in Peoria County, approximately 200 miles. The incorporators are: E. H. Sennef, A. N. Trueb, J. W. Duck, F. W. Krohn and Jonathan Proves, all of Chicago.

SCHOODNIC STEAM RAILWAY.—Plans are being made by the Great Northern Paper Co. to build a railroad from its mills on the west branch of the Penobscot river, Maine, on the Bangor & Aroostook, in Millinocket, to a point near the junction of the east and west branches of the Penobscot river in Medway, 18 miles. Construction work is to be started as soon as surveys, now under way, are completed.

SEABOARD AIR LINE.—This company is planning to make extensive improvements on its road between Wilmington, N. C., and Lincolnton, N. C., a distance of about 200 miles. Heavier rails will be laid and the track made first-class in every respect.

SOUTHERN.—This company has secured necessary rights for additions to its yards at Asheville, N. C., where \$150,000 improvements will be made.

VALDOSTA & NASHVILLE.—A charter has been granted this company in Georgia, with a capital of \$300,000. H. B. Peeples, J. A. Alexander, J. W. E. Poell, of Nashville; R. D. Stevens and others, of Valdosta, Ga., are incorporators.

VIRGINIA AIR LINE.—This company has been chartered at Charlottesville, Va., with \$25,000 capital. T. O. Troy, Amherst, Va., is President, and J. M. Robertson, Secretary, Charlottesville, Va.

WASHINGTON, IDAHO & MONTANA.—Work is to be started at once by this company on the building of its proposed line through a timber belt of Latah County, Idaho. The line has been located from a point near Avon east to Janesville, about 17 miles.

WEST VIRGINIA MIDLAND.—This company, incorporated last year, with a capital of \$50,000, to build a railroad from Sutton, W. Va., to Marlinton, about 50 miles, has bought the Holly River & Addison Railway, operating a line from Holly Junction, W. Va., to Webster Springs, 30 miles, with a branch four miles long. The road is to be extended at once up the Elk River Valley above Webster Springs for a distance of about 20 miles.

WICHITA MOUNTAIN & ORIENT.—Incorporation has been granted this company in Oklahoma, with a capital of \$5,000,000, to build a railroad in Oklahoma and Indian Territories. The incorporators are all residents of Lawton, and include W. M. Smith, H. A. Loyd, E. W. Moll, J. E. Thomas and C. A. Rising. The proposed route is from Lawton, Okla. T., north through Fort Sill, thence northwest, touching the Kansas City, Mexico & Orient near Hobart, through the counties of Comanche, Caddo, Kiowa, Washita, Greer, Roger Mills and Day, and east of Lawton to Atoka, Ind. T.

YOUNGSTOWN & OHIO RIVER.—This company has secured funds and will begin construction work on its road within 30 days. Work is to be started at the southern end of the road at East Liverpool, and a length of 20 or 25 miles is promised to be in operation this fall. The entire road is to be completed between Youngstown and East Liverpool and other Ohio river towns early in 1907.

RAILROAD CORPORATION NEWS.

ATCHISON, TOPEKA & SANTA FE.—Gross earnings for the nine months ended March 31 were \$58,322,293, an increase of \$7,669,235; net earnings, \$22,172,129, an increase of \$4,900,253.

BIRMINGHAM RAILWAY LIGHT AND POWER.—It is reported that this company will be consolidated with the street railway companies of Little Rock, Ark., Memphis, Tenn., Nashville, Tenn., Houston, Tex., and Knoxville, Tenn. A new holding company will be formed. The combined capitalization of the six systems is \$21,745,500, and they operate 376 miles of road.

CHICAGO, BURLINGTON & QUINCY.—See Chicago, Rock Island & Pacific.

CHICAGO, MILWAUKEE & ST. PAUL.—An officer of this road is quoted as saying that the company will acquire the Montana Railroad, which runs from Lombard, Mont., to Lewiston, 157 miles, and has authorized \$3,500,000 capital stock and \$2,000,000 first mortgage 5 per cent. bonds of 1930.

Gross earnings of the C., M. & St. P. for the month of March were \$4,537,679, an increase of \$246,054; net earnings, \$1,808,468, a decrease of \$7,707. Gross earnings for nine months ended March 31 were \$41,965,279, an increase of \$4,084,700; net earnings, \$14,781,630, an increase of \$635,433.

CHICAGO, ROCK ISLAND & PACIFIC.—This company has secured trackage rights over the C., B. & Q. from Kansas City to Rushville, Mo., 48 miles. The Rock Island already has a road from St. Joseph, Mo., to Rushville, so that this new arrangement gives it a through line from St. Louis to St. Joseph.

COLORADO & SOUTHERN.—See Rock Island Company.

COLORADO SOUTHERN, NEW ORLEANS & PACIFIC.—A meeting of the stockholders has been called for May 15 to vote upon a proposition to decrease the authorized capital stock from \$12,000,000 to \$2,000,000.

ERIE.—Gross earnings for the nine months ended March 31 were \$37,880,906, an increase of \$4,435,739; net earnings, \$10,709,965, an increase of \$2,072,331.

GREAT NORTHERN OF CANADA.—Application will be made on May 30 for authority to merge with this company the Quebec, New Brunswick & Nova Scotia and the Chateaugay & Northern. The C. & N. runs from Montreal, Que., to a connection with the Great Northern, at Joliette, 37 miles. Its authorized capital stock is \$2,000,000; there are also authorized \$1,110,000 5 per cent. bonds, none of which have been issued.

HOCKING VALLEY.—Plans are under way for the retirement of the \$15,000,000 preferred stock by, probably, an issue of 4 per cent.

bonds. The \$11,000,000 common stock, on which 3 per cent. is now paid, can then be put on a 6 per cent. basis. It is expected that in July, if this readjustment is made, there will be a change in the status of the Kanawha & Michigan, a company controlled by the Toledo & Ohio Central which is, in turn, owned by the Hocking Valley. The committee formed some months ago to protect the interests of the K. & M. minority stockholders has offered the Hocking Valley \$75 a share for the majority stock, about \$15 more than the present market price. If this is refused, as seems likely, the committee will offer to sell the stock deposited with it, \$2,800,000 of the total \$9,000,000 outstanding, at a price considerably above the present market valuation.

INTERBOROUGH RAPID TRANSIT.—According to the contract between this company and New York City, the company agreed to pay the city annually 1 per cent. on the \$46,116,000 bonds which the city issued to pay for the construction of the subway; these instalments to be deposited as a sinking fund for the ultimate retirement of the stock. Payment was to begin at the end of five years from the beginning of operation, or at any time when the company's "profits" should exceed 5 per cent. of the cost of the road. The question has now been brought up as to whether such profits have been earned, and the decision depends on whether or not the \$1,249,453 interest on bonds paid to the city as rental, is to be included in operating expenses. If it is so included, the net earnings of the company amount to less than the 5 per cent. mentioned.

KANAWHA & MICHIGAN.—See Hocking Valley.

MARYLAND, DELAWARE & VIRGINIA.—This company, a subsidiary of the Pennsylvania, owns 77 miles of road in Maryland and Delaware, and over 1,000 miles of steamship lines. It is a reorganization, effected February 1, 1905, of the Queen Anne's Railroad and of two steamboat companies; it has just issued its first annual report, covering the 11 months ended December 31, 1905. The gross earnings for this period were \$659,513, and the net earnings \$27,864. A year ago the bankers who bought the bonds of the new company stated that it was expected that the gross earnings, which had been about \$750,000, would increase to about \$1,200,000, and that the operating ratio would be about 70 per cent. The actual unfavorable showing was mostly due, it is stated, to the short crops, and the decrease in the traffic peculiar to the region served by the company.

MISSOURI, KANSAS & TEXAS.—The New York stock exchange has listed \$3,448,000 additional first and refunding 4 per cent. bonds of 2004. Of this amount \$1,500,000 were issued for rolling stock, \$500,000 for lands, terminals and shops at Parsons, Kan., and Phillips, Ind. T., and the remainder for terminals at Kansas City.

MONTANA.—See Chicago, Milwaukee & St. Paul.

PANAMA.—The Senate Panama Canal Committee has recommended an appropriation to buy \$2,251,000 of the \$2,879,000 outstanding first mortgage 4½ per cent. bonds of 1917 of the Panama Railroad.

PENNSYLVANIA & OHIO (ELECTRIC).—A meeting of the stockholders has been called for May 26 to act on a proposition to increase the capital from \$700,000 to \$1,600,000. (April 27, p. 130.)

ROCK ISLAND COMPANY.—An agreement has been made between this company and the Colorado & Southern by which the two companies will make up equally any deficiency in the earnings of the Trinity & Brazos Valley necessary to meet the interest on the \$9,000,000 bonds to be issued under the C. & S. refunding and extension mortgage for completing the T. & B. V.

TEMISKAMING & NORTHERN ONTARIO.—The Government of the Province of Ontario will issue in July \$3,000,000 stock or bonds to pay for 50 miles of construction of the T. & N. O. This road is being extended 100 miles north from Liskeard to a connection with the surveyed line of the Grand Trunk Pacific.

TRINITY & BRAZOS VALLEY.—See Rock Island Company.

UNION PACIFIC.—The option to convert the first lien convertible 4 per cent. bonds into common stock expired on May 1. There are now outstanding \$880,000 of these bonds which the company can redeem at 102½ per cent. and interest. As the Union Pacific stock is now quoted at about 141, the bond holders who failed to take advantage of the privilege of conversion lost about \$385 per bond, paper value.

UNITED RAILWAYS INVESTMENT CO. OF SAN FRANCISCO.—The directors have decided to pay the expected 4½ per cent. dividend on the \$15,000,000 preferred stock in scrip instead of cash, in order that the cash in the treasury may be available for immediate needs in San Francisco. The scrip will draw interest at 6 per cent. from May 1, and will be redeemed at par and accrued interest before any cash dividends are paid.

